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Intrahousehold Resource Allocation

An Overview

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Unitary models of household behavior are expedient for policymaking, but the costs of neglecting the collective nature of household decisionmaking and the process of intrahousehold allocation are often high.

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Summary findings

The policy failures associated with inappropriate acceptance of unitary models of household behavior are more serious than those associated with inappropriate acceptance of collective models, contend Haddad, Hoddinott, and Alderman.

They support this claim with illustrations. Consider, for example, the effect of public transfers made to households. The unitary model predicts that the impact of such transfers is unaffected by the identity of the recipient because all household resources are pooled. With the collective model of the household, the welfare effects of a transfer may be quite different if the recipient is a man, say, rather than a woman.

Most of their arguments for the policy relevance of model choice are based on the failings of the unitary model rather than on the strengths of a particular collective model. As a set, collective models may resolve some of the anomalies that have accrued under the unitary model, but further work is necessary to improve their predictive power.

The authors admit to raising more questions than answers — which they regard as positive, considering that a conference in the late 1980s focused on whether it was even worthwhile going inside the "black box" of the household.

The response to that question was that it was worthwhile examining household behavior, but few more definite answers have emerged, for three reasons First, by their nature, the results of gender and intrahousehold analyses are specific to cultures and difficult to generalize, although the process of analysis can be generalized. Second, there is a lack of consensus about which conceptual model of the household to use both across and within social science disciplines. And third, the collection of many intrahousehold data sets i not driven by policy questions.

The challenge, the authors say, is to produce generalizable results useful for policy formulation. In that regard, it seems desirable to apply a common conceptu approach to the analysis of policy-oriented case studies from a regionally diverse set of countries.

Hypotheses about these studies could be developed and tested with and without the benefit of intrahousehold information to carefully measure the tradeoffs between the additional project and policy insights derived (and mistakes avoided) and the extra burdens of the analysis itself.

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INTRAHOUSEHOLD RESOURCE ALLOCATION: AN OVERVIEW

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1. INTRODUCTION

Most development objectives focus on the well-being of individuals. For example, policy targets are often related to the percent of individuals that can read, are free from hunger, are in good health, can find gainful employment, and will avoid death from disease or violence. While it is widely recognized that the welfare of an individual is, in large part based on a complex set of interpersonal interactions, many development policies do not acknowledge these economic and social interactions. The interactions can affect, and be affected by, the creation (and dissolution) of many institutional forms: family, household, business, club, or commune, to name a few. For the first two institutions in this list, both the processes by which resources are allocated among individuals and the outcomes of those processes are commonly referred to as "intrahousehold resource allocation."[1]

Taking this broad definition, this essay surveys a diverse body of evidence on intrahousehold resource allocation issues. Emphasis is placed on why and how a better understanding of intrahousehold processes will strengthen policy formulation and implementation, and how that better understanding may be achieved. The evidence suggests that under many different circumstances, the benefits to policy of understanding intrahousehold resource allocation may far outweigh the costs of acquiring that understanding. First, recent conceptual and methodological developments in the fields of economics and anthropology that promise to accelerate our ability to grasp the inner workings of households and families are discussed. Second, the effect of an improved understanding of how resources are allocated within households on policy impact is shown.

The idea that the household represents a place of exchange and can be thought of as a firm has a long history in economics (Chayanov

1986). However, the economics of the family and household was fully brought into the mainstream by Becker. The essence of Becker's approach was that, in accordance with one set of preferences, the household combined time, goods purchased in the market, and goods produced at home to produce commodities that generated utility for the household (Becker 1965).

Until recently, much policy analysis has implicitly concurred with this Beckerian view that "the household" behaves as if it has one set of preferences, represented by a household utility function. In other words, the household is treated as if it were a unitary entity. For a given set of prices and pooled nonlabor income, resources are allocated to household members according to their ability to translate those resources into goods from which the household, in accordance with a common set of preferences, derives utility. For example, "the household" may decide to allocate more health resources to a boy than a girl because, compared to the girl, the boy can translate good health into more income via the wage market. However, this initial allocation decision may be reinforced or even reversed, depending on the comparative utility derived by "the household" from the good health of the boy and girl.

However, a growing body of empirical and theoretical evidence from several disciplines suggests that the unitary view of the household is an expedience that comes at considerable, and possibly avoidable, cost. Alternative views of the workings of the household are obtained by a heterogenous group set of approaches called "collective models."

The two essential commonalities exhibited by collective models are first, that they allow different decisionmakers to have different preferences, and second, that they do not require any unique household welfare index to be interpreted as a utility function. These models thereby allow the index to be dependent on prices and incomes, as well

as "tastes". While both unitary and collective models allow public policy to change intrahousehold allocations of a good, only the latter permits public policy to affect the *rules* of intrahousehold allocation.

RECENT METHODOLOGICAL DEVELOPMENTS IN MODELING INTRAHOUSEHOLD RESOURCE ALLOCATION PROCESSES

A strong feature of the unitary model is its ability to explain two aspects of household behavior: decisions regarding the quantity of goods consumed and the equal or unequal allocation of those goods amongst household members. The existence of differentials across household members in, say, calorie intakes—even after standardizing by activity patterns—does not necessarily invalidate the unitary model. However, for a number of commentators, it is the systematic nature of these inequalities that has cast doubts upon the validity of the unitary model and has lead to the search for more realistic alternatives. As Folbre (1986, 251) comments:

> The suggestion that women and female children "voluntarily" relinquish leisure, education, and food would be somewhat more persuasive if they were in a position to demand their fair share. It is the juxtaposition of women's lack of economic power with the unequal allocation of household resources that lends the bargaining power approach much of its persuasive appeal.

Collective models take as given the individuality of household members. *It is important to note, however, that discrimination is permitted by both models of the household.* Under either model, discrimination is a preference for, say, girls over boys, when there are no productivity reasons to favor either sex: parents simply derive more utility from allocating more resources to one child or another. The unitary model has parents in agreement on the nature of

the discrimination, but collective models do not impose this common preference on both parents.

Figure 1.1 presents a diagrammatic taxonomy of economic models of the household.[2] Unitary models represent a special case of cooperative collective models where preferences are identical and, as a consequence, resources are pooled. Collective models can be divided into cooperative and noncooperative models. All collective models are Pareto optimal, but only some noncooperative models exhibit this property.

In the cooperative approach, individuals have a choice of remaining single or of forming a household. They choose the latter option when the utility levels associated with being together outweigh the utility derived from being single. For example, there may be economies of scale associated with the production of certain household goods, or there may be some goods that can be produced and shared by couples but not single individuals. The existence of the household generates a surplus, which will be distributed amongst the members; the rule governing this distribution is a central issue of the analysis.

Starting from this common framework, two subclasses of cooperative models have emerged. Models of the first category suppose only that household decisions are always efficient in the (usual) Pareto sense. In particular, nothing is assumed a priori about the nature of the decision process, or, equivalently, about the location of the final outcome on the household Pareto frontier. This does not mean that the rule of repartition governing intrahousehold allocation is nonessential, but rather that it has to be estimated from the data rather than postulated a priori. This more general viewpoint is especially convenient for assessing the relative relevance of the competing frameworks. In particular, an important

finding is that the efficiency hypothesis is sufficient to generate strong testable restrictions upon household behavior (Chiappori 1992).

Models of the second subclass impose more structure on the household, by representing household decisions as the outcome of some bargaining process, and applying to this framework the tools of cooperative game theory. Then the division of the gains from marriage can be modeled as a function of each member's "fallback" or "threat point" position, itself a function of extra-environmental parameters such as laws concerning alimony and child support and prohibitions on women working outside the home (McElroy 1990).

The noncooperative approach (Ulph 1988; Kanbur 1991; Lundberg and Pollack 1992) relies on the assumption that individuals cannot enter into binding and enforceable contracts with each other. Instead, individuals' actions are conditional on the actions of others. The conditionality of action implies that not all noncooperative models are Pareto optimal. However, work by McElroy suggests that this is not as serious as it may seem, because noncooperative solutions can serve as threat points in cooperative models. As McElroy (1993) notes, separation is not a credible threat in a cooperative bargaining model in the context of small daily decisions.

HOW CAN DEVELOPMENT POLICY BE IMPROVED THROUGH AN UNDERSTANDING OF INTRAHOUSEHOLD RESOURCE ALLOCATION PROCESSES?

Irrespective of whichever model of the household is more appropriate in a given place and time, a number of policy measures are likely to be undermined by a failure to view the household and family in a holistic manner. The importance of understanding the household economy in order to evaluate social programs is illustrated by Rosenzweig and Wolpin (1982). They note that social programs that "have been designed for single objectives will, in general, have

multiple consequences often unanticipated by policymakers" (p. 209). Work along these lines was formalized by Singh, Squire, and Strauss (1986) for agricultural producer-consumer households. Singh, Squire, and Strauss stressed that agricultural policy effects are properly assessed through a fuller appreciation of the household economy. They illustrated the importance of accounting for the interdependence of production and consumption decisions taken by semisubsistence farmers. The modeling of demand and supply elasticities under conditions of interdependence and noninterdependence can lead to the generation of very different elasticities that have obvious implications for policy.

This model has proven to be a powerful policy tool and can readily be adapted to explain complex patterns of intrahousehold inequality (Pitt, Rosenzweig, and Hassan 1990). Is the investigation of alternative models, then, essentially a matter of academic intrigue, or does it have a bearing on public policy?

It is argued here that there are important policy areas in which the choice of model matters. Specifically, at least four types of policy failure that will be precipitated by neglect of intrahousehold decisionmaking processes are identified. The first concerns the effect of public transfers made to the household. The unitary model predicts that the impact of such transfers is unaffected by the identity of the recipient because all household resources are pooled. For a household that behaves in a manner consistent with a collective model of the household, the welfare effects of a transfer may be quite different if the recipient is, say, a man, as opposed to a woman.

Second, at the project level, the unitary model implies that it does not matter to whom policy initiatives are directed. This "information source independence" arises because the unitary model assumes that not only is nonlabor income pooled, but so, too, is information. However, the assumption that the self-declared head of household has detailed knowledge of the activities of other relevant

household members will invariably lead to policy failure, such as (i) the nonadoption of particular policies; and (ii) unintended costs arising from policies that are adopted. Failure to facilitate the adoption of new technology or of practices that retard environmental degradation, or the adoption of projects that have make the target group worse off, exemplify faulty policy assumptions.

Third, and perhaps the most important drawback of relying on the unitary model for policy guidance, is that a number of potentially powerful policy handles are disabled. Under the unitary model, policymakers affect intrahousehold resource allocation primarily through changes in prices. Some collective approaches suggest that additional policy handles, often with a very long reach, are available to the policymaker.[3] Examples of these policy handles include changes in access to common property resources, credit, public works schemes, and a general strengthening of legal and institutional rights.

Another example of an implication of knowing the process of infrafamily allocation can be found in nutrition policy. It is often observed that the education of a mother has a strong influence on the nutritional status of a child, even beyond the direct impact on household resources. Strauss, Thomas and Henriques find evidence that this is mediated through information processing, implying that alternative means of conveying information - say, improved nutrition education - may substitute for schooling for those women who have missed an opportunity for formal education. However, if a portion of the observed impact of education is due actually to a shift in the process of infrafamily resource allocation, the impact of conveying specific knowledge is overestimated and the impact of other means of changing relative status of household members is underestimated.

Finally, the nature of interactions between household members will determine whether public transfers are mitigated or enhanced by changes in private behavior. Consider a hypothetical family with

young members residing in towns and old members living in rural areas. Assume a tax is introduced on the urban workers with the revenues used exclusively to subsidize rural wages. Under intergenerational altruism (a form of the unitary model), transfers are made by the altruist "young" to the old, and individual consumption is a function of total family income. Under a collective model with exchange motives (for example, remittances in exchange for tending cattle), individual consumption is a function of individual income. The unitary model predicts that urban-rural remittances will decrease. However, under the collective model, the rural wage subsidy raises the opportunity cost of the provision of the in-kind services, and the urban-to-rural remittances might be expected to increase. In summary, the extent of crowding out is determined by the nature of intrahousehold interactions.

However, these arguments on the importance of collective models in policy analysis do not imply that the indiscriminate adoption of a model simply because it is a member of the collective class is advocated. Despite numerous rejections of income pooling and of polar cases of altruism within a family, to date, no one model of collective behavior dominates the alternatives posed. In fact, most of our arguments for the policy relevance of model choice are based on the failings of the unitary model rather than the strengths of a particular collective model. Put another way, as a set, collective models may resolve a number of the anomalies that have accrued under the unitary model, but further work is necessary to improve their predictive power. This should enhance their usefulness for policy purposes.

2. HOUSEHOLD MODELS AND INTRAHOUSEHOLD RESOURCE ALLOCATION

HOUSEHOLDS, FAMILIES, AND THE UNIT OF OBSERVATION.

Households are a basic unit of interpersonal interaction, generally reflecting both biological and economic commonalities. For purposes of observation, say in a census or survey, coresidency is often primary in determining what interactions are deemed intrahousehold as opposed to other social and commercial affiliations. Clearly, this begs a number of questions.

Residency is one of a number of aspects of shared consumption for which one individual's consumption does not necessarily reduce that available for another. How consumption is shared, and more important, with whom it is shared, may be quite different than the sharing of other resources that are influenced by residency. Similarly, the commonalities that promote sharing of consumption may differ from the interactions that are central to nonmarket-mediated sharing of productive resources.

Indeed, for a number of purposes, the functional household is not a coresident unit. Nuclear families may be spatially separated due to migration, yet economically linked by remittances. Similarly, families are linked over generations by shared consumption and asset bequests, even though they may not be a household by many conventional definitions. Moreover, polyandrous and polygamous families are often only partially overlapping physical units. Thus, for many purposes, any study of intrahousehold resource allocation must take the broader perspective of intrafamily resource allocation.

Nor is it always sufficient to focus on the household, however defined, at a single point in time. There are both policy and measurement issues that revolve around an understanding of how

households form and dissolve. Inherent in many of the models of intrahousehold allocation is an implicit contractual relationship under which a union is formed, with attendant rights, obligations, and penalties. This process reflects the initial views and endowments of the members of the household and partially determines how these will evolve.

The basic economic model of household formation is due to Becker (1973, 1974a). Becker argues that households are formed to (i) produce goods not available through the market, children being an example; and (ii) exploit gains available from differences in individuals' comparative advantages in the production of certain goods. Though some of these goods could be produced by the market, the ability of spouses to monitor each other's behavior, and their ability to use loyalty to obtain certain ends, minimizes transaction costs. These goods are produced more efficiently within the household than outside it Ben-Porath (1979) and Pollak (1985) discuss this further.

Given the benefits of household formation, why do they ever collapse? Becker, Landes, and Michael (1977) argue that household dissolution occurs as a consequence of imperfect information. That is, individuals do not know enough about their partner when they marry. Once united, partners discover the true benefits available and these may be less than those perceived prior to household formation. Dissolution ensues. In the context of marriage and divorce, Becker, Landes, and Michael note that the link between dissolution and information is consistent with several stylized facts: that individuals who marry at a younger age are more likely to divorce (because they have not spent as much time searching for a suitable partner); that marriages tend to collapse in the early years of marriage; and that the likelihood of divorce falls as the length of

time married increases, reflecting the accumulation by both parties of "marriage-specific capital" that is of little value outside marriage.

A second economic approach to marriage is the collective model. Individuals contemplating household formation draw up a conjugal contract specifying the division of marital gains. Exogenous changes in their fall-back positions make one partner better off outside marriage and this may lead to divorce.[4]

Processes of household formation and dissolution in developing countries have received, at least from economists, scant attention. This is regarded as a serious shortcoming, from both a research and policy point of view. For example, female-headed households are often perceived as a vulnerable group, and one to which certain policy measures should be directed. As indicated by Louat, Grosh, and van der Gaag (1993; also Kennedy and Peters 1992) make clear, this approach is too simplistic. Female headship is not always a good indicator of poverty; the gender of the household head may only affect intrahousehold resource allocation for certain income ranges and certain household structures. Such findings beg the question: what are the processes by which households are formed and dissolved? Second, changes in marriage markets—the mechanisms by which individuals find other individuals with whom to form a household—can, in the long run, offset the intended impact of policy interventions (Lundberg and Pollak 1992; McElroy, 1993).

MODELS OF HOUSEHOLD DECISIONMAKING

The Unitary Model

Most models for household-level analysis assume that the household behaves "as if" it were a single entity. A single welfare function represents the household's preferences. All household resources (capital, labor, land, and nonlabor income) are pooled and all expenditures are made out of pooled income. The focus here is on

the class of models that treat households as units of both production and consumption. Certainly, all households are producers of so-called Z-goods, that is, commodities produced by combining market-purchased goods with labor—child care is an example. Of course, many households are producers of other goods: crops or livestock in the case of rural households and goods produced in owned business enterprises in both urban and rural areas. Following Chiappori et al. (1993), this is called the "unitary" model, because this label describes how the household acts—as one.

The basic unitary model is summarized by Singh, Squire, and Strauss (1986). Household welfare is defined over three goods: an agricultural staple, a market-produced good, and leisure. This is maximized subject to three constraints: a cash constraint (the sum of cash expenditures equals the value of net sales less net input costs), a time constraint, and a technology constraint (that is, the level of output associated with different combinations of inputs). Solving this constrained maximization problem generates, in the first instance, the result that labor is used on the enterprise to the point where its marginal return equals its marginal cost. Provided that own and hired labor is homogeneous, and that well-functioning labor and output markets exist, labor refers to the amount of labor employed; it is not solely family labor. Because the household does not need to decide how much labor it is supplying, production decisions are separable from consumption and labor decisions. The value of full income associated with profit maximizing behavior, together with the prices of goods and wage rates, determines consumption of the agricultural staple, the market-produced good, and leisure.

A critical feature of this model is that it relies on a number of assumptions, including homogeneous labor and well-functioning labor markets, in order to obtain separability. Separabilty also may fail if markets for credit and insurance are absent or if health influences

earnings. If separability fails to hold, income as a regressor in equations that examine the determinants of the demand for goods, including such goods as child health, cannot be included. That is, the model can not be trated as recursive. Instead, a reduced form must be employed with only prices and assets appearing on the right-hand side (and, of course, even the latter are endogenous over a long enough time horizon).[5]

As Singh, Squire, and Strauss (1986) note, separability is a testable assumption. The evidence to date is mixed. Lopez (1986) rejects separability, and Deolalikar and Vijerberg (1987) find that own and hired labor are not perfect substitutes in India and Malaysia. Benjamin (1992), however, has found support for separability in labor decisions in rural Java.

An attraction of the unitary approach is that the list of arguments in the maximand can be extended to cover the demand for almost any type of good and also its distribution amongst household members (Pitt 1993). Indeed, it must be stressed that the unitary model is by no means silent on issues of intrahousehold distribution. However, recall that this approach relies on the critical assumption that there exists a household welfare function. If individual members have different preferences, the assumption of a household utility function requires that these differing preferences be aggregated. To be truly comfortable with conclusions resulting from applications of the unitary model, it would be reassuring to know that such an assumption has a strong theoretical basis.

One possibility, outlined by Samuelson (1956), is that the household welfare function reflects a consensus amongst members. However, this does not indicate how such a consensus is reached. A second approach applies Sen's (1966) model of cooperatives to the household. Here, family welfare is the weighted sum of the net utility of all members. But in the absence of a dictator, or

"symmetric sympathy," it is unclear how these weights are determined. They could be the outcome of a voting scheme. Yet there are a wide range of circumstances under which this fails to generate a unique ordering of preferences (Sen 1986). Another weakness of this justification is that the corresponding aggregate index will not be equivalent to a welfare function unless it is independent of prices and incomes. Ruling out a priori any effect of incomes upon intrahousehold weights is also a very strong assumption.

Another possibility is that there exists a household dictator capable of imposing his or her preferences on other members. However, such a dictator must have some means of enforcing the preference ordering. An ingenious solution to this problem is Becker's (1974, 1981) "rotten kid theorem."

Becker considers the case of a household with two members, a benefactor and a recipient. The benefactor is an altruist, deriving utility not only from her own consumption (c_b), but also from the utility associated with the recipient's consumption. By contrast, the recipient is selfish, deriving utility solely from his own consumption (c_r). Formally, their utility functions can be written as:

$$\text{benefactor's utility:} \quad U_b = U_b[c_b, U_r(c_r)],$$
$$\text{recipient's utility:} \quad U_r = U_r[c_r]. \tag{1}$$

Suppose the initial incomes of the benefactor and recipient are givenat a level such that the benefactor's consumption level associated with this income is suboptimal; as an altruist, she could be made better-off by transferring some amount to the recipient, raising his consumption. Now suppose the recipient behaves "rottenly" —specifically, he undertakes some action that raises his own income at the expense of the benefactor. Were the amount transferred by the benefactor unchanged, this would make the recipient better-off. However, the benefactor maximizes her utility by making a much smaller transfer to the recipient, with the net effect of reducing the

recipient's level of consumption below his original level. Knowing this, the recipient will not behave rottenly in the first place.

This is an attractive result. The rotten kid theorem resolves the problems of aggregation and enforcement. The preferences of the altruist become the preferences of the household; the household's maximand becomes the utility function of the altruist. However, the rotten kid theorem only holds under restrictive circumstances.

First, note that the benefactor must be altruistic over all levels of the consumption of others. Consumption by others can be neither an inferior or luxury good—otherwise the threat of reduced transfers may not be credible over all levels of consumption. Moreover, the theorem assumes that any attempt by the recipient to disrupt the given distribution of consumption is small relative to that available to the altruist. That is, a kid could not be so rotten that he reduces the altruist's consumption below his initial endowment, while raising his own above its previous (endowment plus transfer) level. Further, not only must the resources of the altruist be larger than any one individual, they must also be larger than any coalition of household members. If this was not the case, it may be possible for a group of individuals to behave rottenly, increasing their collective consumption at the expense of others.[6]

Hirshleifer (1977) has suggested that Becker's result is dependent on who makes the last move. Specifically, if the rotten kid can act after the benefactor has transferred consumption (as in King Lear), he can behave selfishly without fear of retribution. Bernheim and Stark (1988) and Bruce and Waldman (1990) develop a line of criticism known as the Samaritan's Dilemma. Assume there are two household members who live for two periods. One is altruistic while the other is selfish. Both consume a portion of their endowment in the first period. In the second period, the altruist divides his remaining resources between himself and the other person. The selfish

member consumes the rest of his endowment and the transfer from the altruist. However, because the selfish agent knows that the altruist will make a transfer to him, he consumes more in the first period than he would in the absence of a transfer. The altruist can only prevent such behavior by consuming more in the first period than he would do otherwise. This generates inefficiency as the utility of the altruist falls below that which he would have obtained had the selfish member not attempted to free ride. Bergstrom (1989) generalizes these results and shows that the rotten kid theorem collapses when a second commodity is introduced. Only under the strong condition of transferable utility does it continue to hold.

The Collective Approach

In the absence of some strong assumptions, such as households consisting of members with identical preferences, or the existence of an omnipotent and omniscient household head, the assumption of a household welfare function is difficult to maintain. Yet, alternatives to this approach have not been widely adopted. A major reason for this is given by Rosenzweig and Schultz (1984, 522):

> If the joint family utility framework is to be replaced by a less parsimonious model of intrafamily resource allocation, the increase in complexity should be explicitly demonstrated to have empirically distinguishable predictions.

A broad class of alternative household models that do not impose the assumptions of the unitary model is now considered. Following Chiappori et al. (1993), these are called "collective" models, to distinguish them from the unitary approach discussed above. These do not require any unique household welfare index to be interpreted as a utility function. This allows the index to be dependent on prices and incomes, as well as "tastes" (Chiappori, 1993). There are two broad types of collective model: cooperative and noncooperative. The

unitary model can be seen as a special case of this more general class of models.

Noncooperative Models. The noncooperative approach does not assume that members necessarily enter into binding and enforceable contracts with each other. Examples of this approach include Leuthold (1968), Ashworth and Ulph (1981), Ulph (1988), Woolley (1988), Kanbur (1991), and Carter and Katz (1993). The approach is illustrated via a summary of Carter and Katz.

They assume that individuals within the household not only have differing preferences, but act as autonomous subeconomies. Each individual controls their own income and purchases commodities subject to an individual (nonpooled) income constraint. A net transfer of income between individuals establishes the only link between them. Each individual has a utility function consisting of a good they exclusively consume (x_m, x_f) and some commonly consumed Z-good (z), conditional on the level of net transfers (Θ). These are maximized subject to three constraints: a cash income constraint, a Z-good production function, and a time constraint. Formally, this can be written as:

$$\begin{array}{lll} \text{Max} & U_f(x_f, z|\Theta) & \text{Max} \quad U_m(x_m, z|\Theta) \\ & x_f, l_f^z, l_f^w & x_m, l_m^z, l_m^w \\ & \text{s.t.} & \text{s.t.} \\ & p^f x_f \le w_f l_f^w + \Theta & p^m x_m \le w_m l_m^w - \Theta \\ & z = a_z(l_f^z + l_m^z) & z = a_z(l_f^z + l_m^z) \\ & l_f^z + l_f^w \le L_f & l_m^z + l_m^w \le L_m), \end{array} \qquad (2)$$

where l^z_f is f's labor time supplied to z-good production; l^z_m is m's labor time supplied to z-good production; l^w_f is f's labor time supplied to wage work; l^w_m is m's labor time supplied to wage work; p^f and p^m are the prices of x_f and x_m respectively; and w_f and w_m are female and male wage rates respectively.

In this noncooperative setup, it is assumed that when making her decisions, f takes Θ as given and chooses x_f in order to maximize her own utility (U_f) subject to the constraint that her purchases are less than her own income plus net transfers. This yields a demand function for x_f, which is a function of p^f, w_f and Θ. A similar function exists for x_m, which is a function of p^m, w_m and Θ. The Nash equilibrium (given what m is doing, f cannot do any better and vice versa) is the pair of x_f and x_m that satisfies both demand functions simultaneously. An attractive aspect of this approach is that it does not assume that income is pooled—a feature in agreement with many of the empirical studies reviewed later.

Cooperative Models. Broadly speaking, there are two types of cooperative approaches. Models in the first category only suppose that household decisions are always efficient in the (usual) Pareto sense (Apps 1981, 1982; Apps and Rees 1988; Kapteyn and Kooreman 1990; and Chiappori 1988, 1992, 1993). In particular, nothing is assumed a priori about the nature of the decision process, or equivalently, about the location of the final outcome on the household Pareto

frontier. This does not mean that the rule of patriation governing intrahousehold allocation is nonessential, but rather that it has to be estimated from the data rather than postulated a priori. This general approach is especially helpful for assessing the relative merits of competing frameworks. In particular, an important finding is that the efficiency hypothesis is sufficient to generate strong testable restrictions upon household behavior.[7]

Models of the second class impose more structure on the resource allocation process. These models represent household decisions as the outcome of some bargaining process, and apply to this framework the tools of cooperative game theory (Manser and Brown 1980; McElroy and Horney 1981; McElroy 1990). McElroy (1993) provides a detailed description of this approach.

The cooperative household model can be depicted with two individuals, m and f, who, when they live separately, have utility functions of $U_m^0(x_0, x_m, l_m)$ and $U_f^0(x_0, x_f, l_f)$, respectively. Here, x_m is a good consumed solely by m, x_f is a good solely consumed by f, l_m and l_f are leisure, and x_0 is a public good consumed both when individuals are a household and when they are apart (household cleanliness, for example). Let p be a vector of the prices of all goods, w be the wage rates of m and f, and I_f and I_m their respective nonwage incomes. If m and f live separately, their utility functions are maximized subject to a full income constraint. Their indirect utility functions can be written as $V_m^0(p_0, p_m, w_m, I_m; \alpha_m)$ and $V_f^0(p_0, p_f, w_f, I_f; \alpha_f)$. The α's are refered to as extrahousehold environmental parameters (EEPs).

Now suppose that these two individuals are considering forming a single household. We denote utility functions when married as U_m and U_f, respectively, where U is defined over the household public good, individual consumption of goods, and leisure.[8] Both individuals gain from household formation when:

$$U^j - V^j > 0 \quad \text{for } j = m, f. \tag{3}$$

How are these gains apportioned? One approach is to assume that these individuals negotiate with each other. The outcome of this is a binding and enforceable agreement regarding the division of gains from marriage. One such agreement, which has received much attention, is to assume that individuals agree to maximize a "Nash utility gain product function." This takes the form of:

$$N = (U_m - V_m)(U_f - V_f). \tag{4}$$

This is maximized subject to a joint full-income constraint, namely:

$$p_0x_0 + p_mx_m + p_fx_f + w_fl_f + w_ml_m = (w_m + w_f)T + I_m + I_f. \tag{5}$$

This yields the following demand functions:

$$\begin{aligned} x_i &= x_i(p, w, I_m, I_f; \alpha_m, \alpha_f) \quad i = 0, m, f \\ l_i &= l_i(p, w, I_m, I_f; \alpha_m, \alpha_f) \quad i = m, f. \end{aligned} \tag{6}$$

Note that in addition to prices of goods and leisure, these demand functions include nonwage income and the extrahousehold environmental parameters. As McElroy (1990) emphasizes, the unitary model is a special case of this Nash model, with the parameters on I_i and α_i set equal to zero. This is a testable restriction. The EEPs are variables that shift individuals' threat points (McElroy 1990; 1993). In the context of developed countries, she suggests that these would include measures of the relevant marriage and remarriage markets, laws concerning alimony and child support, changes in tax status associated with moving between marital states, the ability of each person to receive assistance from his or her own family (itself perhaps a function of parental wealth), and prohibitions on work outside the home.

Further Comments. There are several general features to note regarding these models. First, it would be desirable if the outcome by intrahousehold bargaining were Pareto optimal. This is not a

problem for cooperative models, where given certain assumptions, Pareto optimality is obtained. By contrast, this is rarely the case with noncooperative models.

Second, recall that an appealing aspect of Becker s approach is that it resolved the problem of enforcement; that is, how did the household head ensure that everyone did what he wanted them to do? How do collective approaches resolve this issue? The threat of marital dissolution is possible in the context of long-term decisions but, as McElroy (1993) notes, "In the context of small daily decisions, it is not credible for either spouse to threaten divorce". She suggests that decisions regarding short-run issues can be motivated by the anticipated loss associated with delays in settling disagreements, (see the work of Binmore, Rubinstein, and Wolinsky, 1986). An alternative solution is suggested by Lundberg and Pollak (1992). They develop a collective, cooperative model of household behavior with a noncooperative Cournot-Nash solution within marriage as the threat point. (That is, the man and woman may start with a cooperative agreement, but if this does not work, they fall back on the noncooperative equilibrium.) Lundberg and Pollak call this a "separate spheres" equilibrium. At this point, husbands and wives are responsible for a distinct, gender-specific set of activities. As minimal coordination is required at this threat point, "each spouse makes decisions within his or her own sphere, optimizing subject to the constraint of individual resources" (Lundberg and Pollak 1992).

Third, the vast majority of cooperative models have relied on a Nash solution; several commentators have expressed concern over this (For example, Chiappori 1988b). At one level, this is unproblematic. Binmore, Rubinstein, and Wolinsky (1986) show that the Nash cooperative solution is, under certain circumstances, the limiting case of a noncooperative game of alternating offers. Harsanyi and Selten (1988) also argue that the Nash cooperative solution emerges

from a number of noncooperative frameworks. Yet, at another level, it is problematic: the failure of an empirical model to differentiate between competing approaches could reflect the genuine absence of a difference or merely the inappropriateness of the bargaining model adopted.

Fourth, these collective models (and the policy implications derived from them) are developed in a static context. For example, the operations of the marriage market are assumed to be exogenously determined. Relaxing this assumption alters the impact of policy changes on household behavior. Lundberg and Pollak (1992) consider the impact of payment of child allowances to women. In their model, such a scheme will initially improve the intrahousehold distribution of resources in favor of women. But suppose that household formation is preceded by some form of binding agreement (such as a prenuptial contract) that includes the promise of transfers from husband to wife. Once the new child allowance scheme is in place, one might expect that husbands reduce these transfers. As Lundberg and Pollak note (1992),

> With binding transfers, the distributional effect of a policy changing the recipient of child allowances will therefore persist only within marriages in existence at the time of the policy change. For subsequent generations of marriages, adjustments in prenuptial transfers will exactly offset the shift in child allowances.

HOUSEHOLD DECISIONMAKING AND HOUSEHOLD LABOR ALLOCATION

In most household models—either unitary or collective, labor supply is treated as the residual of demand for leisure.[9] However, because most households in developing countries are both producers and consumers, a number of additional issues arise. One issue, whether production and consumption decisions are separable, stimulated the work summarized in Singh, Squire, and Strauss (1986). A second issue is the extent to which productive resources, notably labor, are pooled. If this is not the case, policies requiring the reallocation

of labor within the household may fail. This aspect has received little attention in the theoretical literature on household decisionmaking (Jones 1982 is an exception). Below, several possible approaches to modeling labor allocation within the household are suggested.

Webb's (1989) discussion of the organization of farming activities amongst households in The Gambia are used to motivate this analysis. Webb notes two features. The first is that the farm is "not a unitary enterprise" (Webb 1989, 24). Instead, land is divided into *maruo* and *kamangyango* farms:

> The *maruo* farm comprises a set of fields designated to provide the bulk of the food required by the household .... This enterprise ... is under the control of the compound head .... The harvest of the *kamangyango* field, by contrast, is allocated for individual rather than for communal disposal. Any person in the compound has the right to a *kamangyango* field for which he or she will be solely (or sometimes jointly) responsible.

Webb (1989, 28) further notes that the organization of *maruo* farms conforms to the following hierarchy: at the top is the compound head, who retains ultimate control over crop production.

> But the compound head is not omniscient. However powerful and domineering a single figure of authority may be, it would simply be impractical for one person to make *all* the decisions that are necessary in the day-to-day running of a large household of diverse individuals.

Consequently, decisionmaking is delegated to an upland *maruo* manager and a rice *maruo* manager. In turn, these individuals can call on other household members to assist with production in the *maruo* fields. For example, the upland *maruo* manager can obtain labor from other males residing in the compound, male youths and boys (Webb 1988, 31).

The case Webb describes may be somewhat atypical outside of The Gambia. However, it illustrates a key issue. It may be incorrect to

assume that all household members work solely for the household. Rather, a better approach might be to see them as individuals who work, in part, for a collective entity, and partly on their own account. Although under many unitary or collective models leisure can be considered as a direct analogue to commodities, the fact that productive units are not coincident with consumption units adds an additional layer of complexity. In particular, it introduces problems of incentives, monitoring, and enforcement for the model.

The existing unitary and collective household literature does not adequately address this issue. However, work in other areas such as on principal-agent relations points to ways forward. This work is presented to show that, conceptually, it is possible to develop collective models of household production that yield empirical predictions different from those obtained via a unitary model.

The discussion draws heavily on work by Putterman (1980, 1981, 1986), Putterman and DiGiorgio (1985), and Sen (1966). Under an assumption of a dictatorial household head, one can obtain a Pareto optimal allocation of household resources by allocating an individual's labor to household production to the point where the marginal product of this labor equals that person's marginal rate of substitution between consumption of goods and leisure.

Now consider a noncooperative model in which each person maximizes his or her own utility function and, further, that each person selects his or her own level of labor input, taking the labor inputs of other household members as given. That is, a change in one individual's labor supply does not induce changes in anyone else's labor supply. (This is sometimes referred to as the Cournot assumption.) Finally, in the absence of a dictator, a decision rule is specified that allocates household production to individual members. Let Φ be the proportion of output distributed according to need and $(1 - \Phi)$ distributed according to effort.

Suppose $\theta = 0$. Putterman's model shows that if the average product of labor is greater than the marginal product of labor, the marginal rate of substitution (MRS) between good and leisure will exceed the marginal product of labor (MPL). This is not Pareto efficient. Where output is distributed solely according to work effort, everyone works too hard. Less labor input would increase total welfare. If $\theta = 1$, however, the model finds that the MRS is less than the MPL. When output is distributed solely according to need, everyone works too little. An optimal solution is the interval, $0 < \theta < 1$, where the proportion of output distributed according to effort equals the ratio of the elasticity of output with respect to labor to the share of household income in total output (Sen 1966, 369).

Putterman's model assumes that an individual can only choose between working on the household's land and consuming leisure. It can be shown that even if this assumption is relaxed, the resulting levels of labor input may not be Pareto optimal (Putterman 1986, 90-92). That is, even if one allows for the possibility that i dividuals can also work for themselves, as in Webb's example of the *kamangyango* farm, individuals may not find an efficient labor allocation.

An alternative way of addressing this issue may be found in the principal-agent model. Consider the case of a single principal, the male household head, and a single agent, his wife. The head needs to obtain labor from his spouse in order to produce output from his plot, which is assumed to be fixed in size. His spouse receives income from two sources, a share of the output produced on the head's field, and production on her own account, say from operating her own plot of land or running her own business. The head's income is the value of production on his own field, less the amount paid to other household members.

Three assumptions are now made. The first is the Cournot assumption noted earlier. Second, that the sharing rule, A_i, is chosen so as to equate the agent's marginal rate of substitution between work and leisure to their marginal product of labor. The amount of the wife's labor supplied under this condition is denoted as x_i^* and her income from the head's plot as y_i^*. Finally, and most importantly, x_i^* and y_i^* are regarded as representing norms of behavior with respect to labor input and compensation within the household. Such norms are analogous to the noncooperative equilibrium within a household as specified by Lundberg and Pollak (1992), where such an equilibrium represents traditional gender roles.

The head is essentially a residual claimant to production on his plot. As such, it is in his interest to encourage other members to supply additional labor. One means of doing so is for him to offer an ex post "reward" for labor over and above x_i^*. The reward is paid in terms of a complementary input necessary for the agent to produce on her own account, say, for example, capital that is rationed elsewhere. The spouse has an incentive to seek such a reward as it will increase her income. As such, it may be rational for her to work beyond the point where her MRS = MPL. The formal proof of this is given in Paterson (1985).

There are several additional features that could be added to the model. In addition to "rewards," the head could "punish" agents who supplied less than x_i^* labor in the sense that he could reduce the share of output that accrues to such an individual. Second, as the spouse's landholdings increase, it is necessary for the head to offer larger rewards in order to induce additional labor supply. Intuitively, this makes some sense, as the returns to additional labor in own production will rise. Conversely, the presence of additional spouses, the existence of a labor market, or the ability to threaten a spouse with violence should she refuse to provide additional labor,

exogenous changes such as those induced by gender-biased development projects, will all affect the reward structure.

HOUSEHOLD DECISIONMAKING AND INTERGENERATIONAL DISTRIBUTION

In the previous section, intrahousehold allocation of labor was examined. In this section, a second, specific aspect of household decisionmaking—the distribution of other household resources amongst members—is analyzed. The impact of many policy interventions depends on this aspect of household behavior. It is also a key determinant of the extent to which economic advantage and disadvantage is transmitted across generations. As there are a number of very good reviews of this literature, notably Behrman (1991, 1992) and Behrman and Deolalikar (1988), this discussion will be relatively brief.

Under the unitary model, parents have a single set of preferences that yields a utility function defined in terms of their consumption, the adult income of each child, and the size of transfers made to each child (Behrman 1992). This utility function is maximized subject to two constraints: a parental budget constraint and the earnings production function for each child, itself a function of human capital investments made in that child by parents and that child's initial endowment. Behrman (1992) refers to this very general framework as the "parental altruism model." Placing restrictions on this general approach yields two existing models of intrahousehold resource allocation.

One approach, due to Becker and Tomes (1976), is to assume that parents are concerned solely with their children's total level of wealth. It is further assumed that parents have equal concern for each child. Human capital investments are made in children best placed to generate a higher rate of return on these. That is, parents invest in their children in such a way so as to reinforce differences in child endowments. Transfers are made to more poorly endowed

offspring in order to equalize children's wealth. Behrman (1992) refers to this as the "wealth model."

A second approach is the "separable earnings-transfers model" (Behrman, Pollak, and Taubman 1982). Here, children's income as adults and parental transfers to children are separable within the parental welfare function. This assumption permits attention to be focused on the determinants of investment in children. These investments are guided by two concerns. First, parents may be interested in ensuring that all children are equally well-off. Alternatively, they may have preferences for particular children; for example, boys over girls, first born over latter born, their own children over those whom they are raising as foster children. This aspect shall be termed "equity" concerns, though, of course, it is entirely possible that parents prefer unequal outcomes among their children. As in the wealth model, parents also desire to maximize the return on the investment in their children. This is called "efficiency concerns."

Suppose parents care only about equity and have no concerns regarding efficiency. Such preferences imply that they will seek to equalize their children's future earnings. Note that this does not imply that all children will be treated equally. Consider the case of parents who want their daughter and son to receive equal earnings. Suppose the daughter will face discrimination in the labor market; specifically, her wages will be less than that of her comparably qualified brother doing the same work. Here, parents will devote more resources to their daughter (for example, they provide her with more education) in order to equalize future earnings. Conversely, where parents seek to maximize the total future earnings of their offspring, they invest relatively more in those children with the best future prospects. In the example considered here, parents would invest more in their son than in their daughter. That is, parents "reinforce"

existing inequalities in child endowments. It is possible to imagine a series of intermediate cases where both equity and efficiency concerns play a role.

Note again that the unitary model is far from silent on the question of intrahousehold resource allocation. The principal criticism of this approach from a collective standpoint are the implicit assumptions that parental preferences are unified and that children have no influence on decisions made regarding their future well-being (Folbre 1986). However, as Alderman and Gertler note (1993), even if a collective approach is used, it is still necessary to explain why a particular household member chooses to invest more in one child than another. The wealth and the separable earnings-transfers models are particularly well suited for this purpose.

The parental altruism model rules out the possibility that parents might wish to influence the future behavior of their offspring. Bernheim, Shleifer, and Summers (1985), however, develop a collective model of parent-child relations in a noncooperative bargaining framework. They assume that parental utility is a function of parental consumption, utility of their child, and "child's attention to parents." The child derives utility from his own consumption and from supplying "attention to parents." The child is assumed to tire of giving attention before his parents tire of receiving it. The model, therefore, considers differences in preferences across generations, although it presumes a unitary model for parents.

Suppose the child chooses a certain level of attention. Subsequently, the parents make a transfer, such as a bequest, to the child. How is consumption and attention allocated? Suppose the parents do not attempt to influence the level of attention given by the child. Through the appropriate transfer, the parents can determine the level of their own consumption and that of the child.

However, Bernheim, Shleifer, and Summers show that the resulting allocation may not be Pareto optimal. The child could supply more attention without a change in his well-being and parental utility would increase.

How can the parents induce greater attention? Suppose they threaten to disinherit the child unless he or she supplies a given level of attention. If this threat is to be credible, the offer must provide a level of utility to the child at least as high as that provided by the "disinheritance level." Can parents credibly threaten disinheritance? If the parents have only one individual to whom they can leave their estate, then the threat is not credible. Because bequests are unlikely to be made to others, the beneficiary knows that his or her inheritance will be unaffected by his or her behavior. The parents cannot induce higher levels of care. But if there is at least one other potential beneficiary, the threat is credible.

Essentially, the question of how resources are allocated across generations revolves around three issues: At the parental level, what (equity? efficiency? or both?) determines how resources are allocated amongst children? Are parental preferences unified? Do parents, individually or collectively, have an incentive to behave strategically with respect to their offspring? Though theoretical aspects of each issue have received attention, there have been no attempts to integrate these issues.

INTRAHOUSEHOLD RESOURCE ALLOCATION: AN EMPIRICAL REVIEW

We now turn to a selective review of the evidence on the following questions: Is income pooled within the household? What does labor supply data tell us? How do households allocate consumption and human capital investment amongst members?

Is Income Pooled? Testing the Unitary Model Against a Broad Class of Alternatives

Is Income Pooled by Gender? The unitary model implies that all income sources within the household are pooled. However, the view that income is not pooled within the household has figured prominently in sociological and anthropological studies. It is widely perceived that men spend some of their income on goods for their personal consumption. Alcohol, cigarettes, status consumer goods, even "female companionship" have been noted. By contrast, women are believed to be more likely to purchase goods for children and for general household consumption. Guyer (1980) is particularly noted for this observation, although a number of other researchers have commented on the phenomenon as well.[10]

These studies, while extremely valuable in focusing attention on this area, do not constitute a test of the income pooling hypothesis. To see why this is so, consider the following example. Suppose an exogenous change occurs that raises a woman's wages and thereby induces a change in her allocation of time. In the unitary model, the household may decide to reorganize household production so as to increase the woman's labor-market participation. In a cooperative bargaining context, women may decide to renegotiate the gains from marriage on the basis of this new (or enhanced) earning opportunity. Thus, increased women's labor-force participation may alter the distribution of income within the household and this could affect the pattern of household expenditures. Again, this would be predicted by both approaches. In the unitary model, the change in expenditures may reflect the reallocation of members' time. For example, households may purchase fuel rather than gather it. Women may purchase maize flour rather than grind maize themselves.

Similarly, one may have a unitary household in which the correlation between women's cash income and acquisition of certain goods reflects differences in purchasing productivities. If women are working as traders in the marketplace, the household may economize on transaction costs if the woman purchases food in the market (and the man's income is used to purchase other goods). It would be hard to distinguish this household from one in which an increase in women's earnings outside the household changes expenditure patterns, because it raises the woman's bargaining power (either because her threat point is higher or because her perceived contribution within the household has increased). This problem is termed "observational equivalence." That is, the phenomena observed by the studies cited above can be explained by either the unitary or collective model. It is for this reason that economists have sought additional means of gaining insights into household behavior.

In Ulph's (1988) noncooperative model, budget shares are a function, in part, of the intrahousehold distribution of income. Specifically, there exists "... a very clear relationship between the share of expenditure on commodities and the share of household income accruing to the wife" (Ulph 1988, 45). On the empirical side, von Braun et al. (1988) find a positive relationship between the proportion of cereals produced under women's control and household consumption of calories in Gambian households. Garcia (1990) finds that raising the share of income accruing to wives in Philippine households increased acquisition of calories and protein. However, both studies assume that labor supply decisions are exogenous. A bias may exist in that the factors that influence the labor supply decision may be those that account for the differences in budgets. Hoddinott and Haddad (1992) partly control for this by using women's predicted share of household cash income (PFINC). Their approach assumes that certain variables, such as the proportion of landholdings operated by

women, women's share of household business capital, and the ratio of women's to men's education, will influence PFINC but not expenditure shares directly. They find that doubling women's share of cash income within Ivorian households raised the budget share of food and lowered the budget shares of alcohol and cigarettes. These results are conditional on the identifying restrictions they impose. However, their results are robust to changes in functional form, are reflected in reduced-form estimates, and concur with budget shares obtained from an examination of single-sex households.

Alternatively, one can use unearned income, under the assumption that it is independent of labor choices, to identify the impact of changes in female income compared to that of males. Schultz (1990 601-602) notes that

> The challenge to the neoclassical model of household demand arises if nonearned income of different family members is observed to affect differently the household's allocation of resources. If nonearned income (or ownership of the underlying asset) influences family demand behavior differently, depending on who in the family controls the income (or owns the asset), then the preferences for that demand must differ across individuals and such families must not completely pool nonearned income.

An example of this approach is given by Thomas (1990). Drawing on survey data from Brazil, he examines the differential impact of nonlabor income in the hands of men and women. Thomas rejects income pooling in the demand for per capita caloric and protein intakes, fertility, child survival, and weight-for-height for children less than 8 years old. The results for child survival are particularly powerful; increases in the mother's unearned income raises the probability of child survival by 20 times that of a comparable increase in the father's unearned income.

As Thomas acknowledges, it can be argued that nonlabor income is not purely exogenous, because it reflects previous labor supply

decisions. Second, it may be measured with considerable error and this may contaminate parameter estimates. Third, on its own, unearned income cannot be taken as a threat point. For example, individuals may be receiving unearned income in the form of sick benefits because they are temporarily ill. Such income cannot be considered a pure, threat-point shifter. Similarly, some unearned income (such as dowry) may be conditional on being married; it, too, cannot be considered a threat-point shifter. Thomas (1993) tests whether these results are robust to treating nonlabor income as an aggregate or using only asset income. He finds that under both definitions, income in the hands of women is associated with a larger increase in the share of the household budget devoted to human capital (household services, health, and education) and also leisure (recreation and ceremonies) goods.

Similarly, Schultz (1990) distinguishes between transfer and property income in his study of labor supply decisions in Thailand. He finds that unearned income has a significant effect on women's labor supply. "This pattern is clearest in the case of Thai women, where the own nonearned income effect on participation is six times as large as that of their spouse's nonearned income. The preponderant sign of all the labor supply effects of transfer and property income is negative, as anticipated." However, he also finds that women's transfer income is positively and significantly related to fertility, whereas women's property income has no such effect. He notes (p. 623) that "... the connection between transfer income and fertility may reflect the reverse causation to that hypothesized here, where women with more children to support are more likely to receive transfers from family and other groups in society."

Horney and McElroy (1988) examined data from a 1967 sample of American married men and women residing in households where both partners worked. They disaggregated nonlabor income into transfer (pensions, veterans payments, workmen's compensation, other disability

payments, Aid to Families with Dependent Children) and business (business, farm, rental, and interest) income. Transfer income is of particular interest because a number of its components (such as disability and veteran's payments) are independent of marital status. Horney and McElroy found limited evidence that male and female nonlabor income has a differential impact on leisure choice of males (male transfer income reduces male labor supply), though this was not so for females or a composite consumption commodity.[11]

Income Pooling Across Generations. In addition to tests of income pooling, tests of joint movements of consumption have been used to study the allocation within a family. Consider Altonji, Hayashi, and Kotlikoff's (1992) recent test of altruism. They note that "if parents and children are altruistically linked, their consumption will be based on a collective budget constraint, and the distribution of consumption between parents and children will be independent of the distribution of their incomes." Drawing on panel data from the United States, they reject this hypothesis. They find that the resource position of a particular family member—as measured by total income, nonlabor income, home equity, or wage rates—influences the consumption of that member.

The study is fairly robust to alternative measures of income and to dynamic and fixed-effect formulations. While it is still possible that the rejection of altruism is due to a definition of the functional family that is different than that used by the household, the study provides a convincing rejection of a polar case of intragenerational altruism.

Income Pooling in Pareto Efficient Models. The econometric studies discussed above are strongly critical of the income pooling hypothesis. However, they do not provide an unambiguous rejection of

unitary models nor do these studies uncover the process of allocation that does prevail. Recent work by Bourguignon et al. (1992, 1993) derives a set of testable restrictions by solely assuming that household decisions are (Pareto) efficient.

Browning et al. (1992) develop the idea that certain goods within the household are exclusive—that is, they are consumed only by one person. This can be used to recover the household's sharing rule. They use expenditure data from childless Canadian couples who work full time. Using women's clothing as an exclusive good, they recover the sharing rule parameters. Bourguignon et al. (1993) construct a general model that encompasses the unitary and collective frameworks as special cases. This generates two hypotheses: (i) if income is not pooled, the coefficients for male and female income in an expenditure equation should be significantly different from zero; and (ii) the existence of a cooperative model requires that certain restrictions be placed on the coefficients of total household- and individual-level incomes. Using French data consisting of married couples working full time with no or one child, income pooling is rejected but the cooperative approach is not rejected.

What Does Labor Supply Data Tell Us?

While leisure is conceptually similar to other commodities, even in the context of unitary models of households, it is recognized as an exclusive good. Thus, the literature on labor supply provides a number of alternative approaches to testing models of intrahousehold allocation. In a unitary model, cross-substitution wage effects must be equal—"the effect of an income-compensated increase in the husband's wage on the wife's labor supply must be identical to the effect of an income-compensated increase in the wife's wage on the husband's labor supply" (Lundberg 1988, 225). However, results presented in Ashenfelter and Heckman (1974), Kniesner (1976),

Killingsworth (1983), and Lundberg (1988) do not support this prediction.

By contrast, specific aspects of collective models have received empirical support. The differential effects of unearned income on labor supply have already been noted. Kooreman and Kapteyn (1990) present Dutch evidence on couples working at least 15 hours per week consistent with a Pareto-efficient model, with a noncooperative equilibrium acting as the threat point. Of course, all these results are subject to caveats regarding robustness to changes in functional form, and issues relating to sample selection bias (for example, many of the samples used are drawn from married couples). But less has been attempted with respect to the "collective" modeling of household production.

Jones' (1983, 1986) studies of rice cultivation in north Cameroon provides several results of interest:

- women supply a suboptimal amount of labor to their husbands' rice fields, preferring to spend time working on their own sorghum plots. A profit-maximizing household would increase the amount of women's labor supplied to rice production.
- women receive compensation, in cash and kind, for labor they provide to their husbands. This amount rose as more labor was supplied. Also, senior wives in polygamous households and women whose husbands still owed bride-price received higner levels of compensation. Jones notes (1983, 1053), "He can ill-afford to dispute his wife's right to compensation since he needs the additional income he receives from his wife's labor on a second rice field."
- the level of compensation paid is less than the market wage.

> One might wonder why women continue to work for their husbands if they are compensated at a rate much lower than what they could earn working as hired labor. The answer is that, in principle, married women are expected

> to work on their husbands' fields if they are not working on their own. If they refuse to work on their husbands' fields, they risk a beating. (Jones 1986, 111).

These features are consistent with the principal-agent model sketched out earlier. The allocation of labor is Pareto inefficient. As predicted, compensation rises as labor supply is increased. Factors such as seniority within the household, outstanding bride-price payments, society's tolerance of physical violence (an example of an extrahousehold environmental parameter), all affect the level of compensation received.

Jones' example is not an isolated one. Other case studies documenting conflict, compulsion, and negotiation over women's labor allocation, rather than the dictates of a household head, include Conti (1979), Dey (1981), Haugerud (1982), Koenig (1982), Spiro (1984, 1985), Burfisher and Horenstein (1985), McMillan (1987), Babalola and Dennis (1988), Carney (1988), Funk (1988), Ongaro (1988), and Leach (1991). More general discussions of this literature include Roberts (1979), Guyer (1981), Gladwin and McMillan (1988), Whitehead (1990), Kabeer (1991), and Dey (1993). The message of these studies is succinctly summarized by Whitehead (1990, 452), "More than one study has identified women's refusal to perform the family labor that the project had planned for or demanded of them as contributing to the failure of the development project."

While this evidence does not provide rigorous tests of the collective models described earlier, they do provide some qualitative evidence that simplifying assumptions such as the pooling of all labor are flawed.

Observed Patterns of Individual Welfare Within the Household

There exists an extensive literature on gender differences in welfare outcomes, documenting, for example, a bias in favor of boys in mortality rates (Sen 1990), nutrition and health (Behrman 1988, 1992; Harriss 1990), and education (Appleton 1992). Similarly, Subramanian and Deaton (1990) find greater reductions in the consumption of "adult goods" with additional boys in the family compared to girls.[12] Svedberg (1990) provides an African counterexample in the context of nutrition, which serves to spur the need for a theoretical understanding of why such patterns arise in some societies and why they do not in others.

Evidence of bargaining between generations exists in a number of contexts. Stark and Lucas (1988) note that migrants' transfers in Botswana increase when their rural households experience drought. However, a further prediction of the altruism model is the existence of a negative relationship between monetary transfers and the income or wealth of the recipient. Lucas and Stark (1985) find the reverse in Botswana, as does Cox (1987) in the United States and Hoddinott (1992b, 1993) in Kenya. One explanation for this phenomenon is that donor-recipient relations are partially guided by strategic considerations. Recall that in the Bernheim, Shleifer, and Summers (1985) model, parents have an a priori reason to influence the behavior of their offspring. Bernheim, Shleifer, and Summers present supporting evidence from the United States. Hoddinott (1992a) replicates their results using data from western Kenya. In his survey area, land is passed from fathers to sons—daughters do not receive an inheritance. He finds that, ceteris paribus, wealthier elderly parents are able to induce greater monetary transfers (and, to a lesser extent, time transfers) from sons but not daughters—a result consistent with a bargaining interpretation of intergenerational relations. Note that all these results are conditional on past

investments by parents in their children, an especially strong assumption.

As the empirical literature in this area is well served by the above studies and other reviews, notably Behrman (1991, 1992), Behrman and Deolalikar (1988), and Pitt (1993), the approach here is to highlight several key issues.

The first is to stress that work in the unitary framework has been extremely helpful in identifying some of the processes involved in the intrahousehold distribution of resources. In particular, this approach can be used to link different aspects of resource allocation. Pitt, Rosenzweig, and Hassan (1990) study the allocation of food within Bangladeshi households in relationship to both labor supply and individual health. A key conclusion is that households exhibit aversion to inequality, in effect taxing more productive members.

A second issue is that differences across individuals, where they occur, are the outcome of an allocation process; they are not inherent to any single model of the household. Indeed, Rosenzweig and Schultz's (1984) argument in favor of a parsimonious model of the joint family and Folbre's (1984) challenge to it disputed the process, resulting in, but not the fact of, male-female differences in India. Systematic differences in welfare outcomes by age, gender, or relationship to household head reveal a preference—one that often is at odds with observers outside the household—but in the absence of additional information, the existence of preferences does not provide the basis to determine how differences in preferences are resolved.

Thomas (1991) provides evidence that within-household inequality patterns shift as income patterns shift in Brazil. This evidence, then, is analogous to the use of preferences for commodities to uncover sharing rules—albeit a particularly important example from the standpoint of policy. Haddad and Hoddinott (1993) provide similar evidence for rural Côte d'Ivoire. Controlling for unobservable

household characteristics, they show that increasing women's share of household cash income leads to improvements in boys' height-for-age relative to girls.

Third, the unitary model often relies on an assumption that the household head is an altruist, taking the well-being of others into account. This assumption is difficult to maintain when the individual assumed to be altruistic is also the perpetrator of physical violence against other members. Sociological and cross-cultural ethnographic studies show that wife-beating occurs in virtually all societies.[13] Is this issue tangential to the modeling of household behavior? The authors believe not. First, Jones (1986) specifically mentions violence as a means of enforcing labor allocation in Cameroon. Second, altruism is necessary in order to generate Becker's rotten kid theorem. The fact that domestic violence is so widespread, and so common, calls into question the validity of this assumption. Finally, extra-environmental parameters appear to affect the likelihood and severity of domestic violence. Erchak (1984) found little spouse abuse in a Kpelle village in rural Liberia, where neighbors quickly interfered in domestic disputes. By contrast, in urban areas of Liberia, where external intervention was less prevalent, the incidence of abuse was higher. Tauchen, Witte, and Long (1991) find that amongst low- and middle-income American families, increases in the woman's income lowers the level of violence (though this variable is not always significant). For high-income couples, in which most of the income is his, increases in either person's income serves to lower violence.[14] They also find that having a place to stay if threatened also lowers the number of violent incidents. Domestic violence appears to be an example where EEPs affect the intrahousehold distribution of welfare.

LIMITATIONS OF CURRENT TESTS OF NONUNITARY MODELS

Central to many of the empirical studies that test alternative models of intrafamily or intrahousehold allocation are tests of whether the impact of women's income differs from that of men. Despite the range of evidence acquired, there are legitimate econometric issues on which challenges to the interpretation of the results can be based. For example, as mentioned above, it is widely recognized that observed wage income is an inappropriate variable for testing models of intrafamily allocation, since that income reflects household choices about nonmarket activities as well as the allocation of leisure within the household. Thus nonlabor income (transfers and pensions as well as returns to assets) is offered as an exogenous measure of resource control. Furthermore, to be credible as a test of models dependent on a threat point, nonlabor income must not be contingent on the income recipient remaining in a marriage.

Such income, however, may be considered endogenous in a life-cycle context if asset ownership or pension eligibility stems from previous labor participation rather than, say, inheritance or dowries.[15] Any current unobserved differences in tastes and productivity may also have been present in the past and, thus, have influenced asset accumulation. Moreover, asset income is subject to measurement errors that may be systematically correlated with other household characteristics. Since it is difficult to assign ownership to one individual, asset income may also not be assignable. Interviewers responsible for obtaining the data used in subsequent econometric tests, however, may make assignment on a systematic basis (often to the male) to avoid either omission or double counting of the resource flow.

Similarly, if control over resources is enhanced by concealing income, there may be a systematic bias from underreporting. Even in the absence of endogeneity, measurement error that differs by source of income can generate spurious patterns of differences in

expenditures by income source, that is, increase the chance of a false rejection of pooling restrictions.

Commodity demand models also generally reject the restriction of weak separability of leisure and goods (Alderman and Sahn, 1993; Browning and Meghir 1991). While both commodity and labor allocations are used to test models of intrafamily decisions, few commodity models have addressed the potential bias from ignoring labor supply. Moreover, one study that explicitly tests the restriction implied by a Nash-bargaining model (Horney and McElroy 1988) is limited as it poses a demand system in which leisure and commodity demand are separable.

In addition to having testable single-equation restriction on income and, in some cases, cross-equation restriction on commodity substitution, collective models may offer testable restriction regarding the impact of EEPs on demand. These are particularly interesting as they may suggest policy measures that can achieve reallocation towards, say, children's consumption. As with testing of income pooling, however, testing of restrictions on the impact of EEP faces econometric challenges and data limitations. EEPs are unlikely to vary much in cross-sectional data sets. Where variation may be found—over time or across regions—regional difference in tastes or impact of community unobservables may be credible alternative explanations for the patterns observed.

As an illustration, consider Rao and Greene's (1991) detailed analysis of the impact of bargaining on fertility in Brazil. This study is sensitive to the possible endogeneity of individual choices and thus concentrates on regional-level variables as the main evidence for bargaining over fertility choices. For example, the study estimates a negative relationship between fertility and the ratio of males aged 25-29 to females aged 15-19 in the region. A reasonable interpretation of this result takes it as an indication of the availability of alternative spouses. As this ratio increases, women

have a greater chance of remarrying, hence a greater ability to bargain for the smaller families they prefer. Regions that have a lower average preference for fertility, however, will also have higher male-female ratios (due to the age gap in the measure). Thus, variations in regional preferences may also contribute to the result observed and the suggestive results may not be completely free of simultaneity bias.

Rao and Greene view fertility decisions both as products of household joint decisions and strong determinants of conditional choice sets. For most purposes, however, studies of household resource allocation take the household structure as predetermined. Yet, clearly, the formation and dissolution of households—or even seasonal separations due to labor migration—is central to any question of intrafamily allocation. However, as McElroy observes (1993), "The same phenomena that shift threat points in bargaining models also control the gains from marriage realized in a marriage market." This allows for a number of empirical applications of bargaining models to fertility and marriage. However, it also means that it is extremely difficult to model household formation simultaneously with budget allocations conditional on household structure. Thus, the comparisons between demand of married versus divorced individuals offered by McElroy (1990) are hard to implement, due to an inability to account for the sample selection.

Collective models of intergenerational relations (such as Bernheim, Shleifer, and Summers 1985, and Hoddinott 1992b) assume that the number of children, their education, and earnings are exogenous. Yet as the literature summarized in Behrman (1992) makes abundantly clear, child quality and quantity is the outcome of parental decisionmaking, a feature ignored in empirical tests of these models.

It is, nevertheless, difficult to imagine that econometric difficulties singly or jointly can account for the numerous rejections

of income pooling. That is, although not necessarily perfect tests, many of the tests of restriction implied by the unitary model are plausible tests. Collectively, the evidence may be taken as shifting the burden of proof so that unitary models need to be defended rather than maintained.

However, rejecting pooling is not, of course, the same as accepting an alternative model. Various tenable bargaining and sharing models can generate conditions under which income pooling is rejected and/or EEPs contribute to consumption patterns. Thus, there is a particular appeal in the approach taken by Chiappori (1993), because if one good is assignable, a sharing rule can be derived for the entire decision process. While this approach is in contrast to the greater structure that needs to be imposed in order to recover the details—if not necessarily the flavor—of the bargaining process, it, nevertheless, does offer a means of distinguishing between alternative models.

Moreover, specific tests of bargaining or sharing may depend on cultural conditions. For example, not only do the results of Bourguignon et al. (1992, 1993) depend on the economic and legal conditions that make the assumption of fixed labor supply arguable, they pertain to a social structure that differs on many significant points from that in developing countries. In many developing countries, households are larger, more apt to contain more than one adult of the same gender and generation, and more likely to contain three generations than French or Canadian households. Similarly, separation and reformation of households due to migration and child fostering will affect allocation processes differently in different contexts. The fact that cultures differ is not, of course, a direct limitation of their analysis of French or Canadian consumers, but a caveat that reiterates the need for a range of studies before generalities can be drawn.

The focus of this section has been on the processes—unitary and collective—by which intrahousehold outcomes are generated, rather than the outcomes per se. This emphasis reflects the perceptions of the authors of where the gaps are in the intrahousehold literature. On the unitary model of the household, it has been argued that its theoretical foundations are weak; that its underlying assumptions are of questionable validity; and that it has not stood up well to empirical testing. Though caution is warranted in interpreting the evidence that has accumulated over the past decade, there is a strong argument for seeing the collective model as setting the industry standard. In making this claim, the intention is not to discard the unitary model. Rather, the model should be regarded as a special subset of the collective approach, suitable when certain specified conditions hold. Equally important, the indiscriminate use of a model simply because it is a member of the collective class is not advocated. Ideally, a household model should be used only after the restrictions it implies cannot be rejected by the data. This requirement is not simply an academic nicety: the choice of household model can have a significant impact on policy formulation and implementation.

3. POLICY ISSUES AND INTRAHOUSEHOLD RESOURCE ALLOCATION

A dispassionate observer might wonder if this debate, or analyses of allocation among household members, has any relevance outside a narrow academic framework. This concern is addressed below.

From a policy perspective, the costs of neglecting both the collective nature of household decisionmaking and the process of intrahousehold allocation are often high. In particular: (i) regardless of the model used, it is incorrect to assume that policies designed to ameliorate household poverty are sufficient for the

alleviation of individual poverty, and that individual poverty can be alleviated without due regard to household processes; and (ii) erroneous use of the unitary model may result in the nonadoption of beneficial policies, in policies having unintended consequences, and in the loss of policy handles. The next section explores when and why it is useful for policy design to be cognizant of intrahousehold inequalities. Then how the choice of collective or unitary model affects policy formulation and success is outlined. The next section summarizes caveats regarding collective models and the implied priorities for future policy-oriented research. The conclusion follows.

POLICY AND INTRAHOUSEHOLD INEQUALITY PATTERNS

Even if policymakers were agnostic about the usefulness of household models—unitary or collective—it is argued that they neglect patterns of intrahousehold inequalities at their peril. Consider a common policy situation: a government has to target scarce developmental resources. In many situations, the focus is on the poverty of the individual, not the household. Nevertheless, many examples exist when governments either assume (i) that amelioration of household poverty is sufficient for the alleviation of individual poverty, or (ii) individual poverty can be alleviated without regard to the actions of other household members. These assumptions will lead to policy failure, irrespective of the choice of resource allocation model.

Consider a non-welfarist[16] approach to raising the food consumption of undernourished individuals through an in-kind transfer to undernourished households. If it is believed that all resources are pooled within the household, the government will be indifferent to which household member is the recipient. If the identity of recipient matters, then the government may well direct the transfer to women.

However, whichever allocation scenario is true, the government needs to target resources to the most undernourished households. Haddad and Kanbur (1990) demonstrate that the undernourishment rankings of various socioeconomic and geographic household groups can change when individual-level food consumption information is used instead of household-level information. For example, although individual-level data may indicate that individuals from certain households are an important food poverty group, a reliance on household-level data might imply that they are not an important group. This result occurs when patterns of intrahousehold inequality differ between different household groups. If inequality was similar in all groups, food poverty rankings would be identical whether or not individual-level data were used to target the transfer.

Apps and Savage (1989) draw similar conclusions from an analysis of U.S. data. They show that welfare orderings of U.S. households are very sensitive to the neglect of intrahousehold inequality. Moreover, the rankings are also sensitive as to how intrahousehold resource allocation is measured. Apps and Savage model demand as allowing transfers between spouses (either money or household services) and they report a considerable amount of re-ranking of households (based on individual incomes) as a result of different assumptions about the magnitude and type of transfer. They conclude that this has important implications for the design of a tax and welfare system.

Two other studies explicitly dispel the notion that the improvement of household nutrition is sufficient for the improvement of preschooler nutrition. Pelletier et al. (1991) test the hypothesis that the nutrition status of older household members is strongly reflected in that of young children, and that associated socioeconomic factors are the same for both age groups. The study shows that, in a Malawian sample, the first assumption is more valid than the second, but then only during acute food shortages. Work by Senauer and Garcia

in the Philippines (1993) arrives at similar conclusions: if intrahousehold food allocation patterns are inequitable relative to requirements, then targeting preschoolers based on household-level indicators may be a very costly way of raising preschooler food intake.

Let us turn to programs that do rely on individual-level data for targeting purposes. Often these programs confuse the need to isolate the individual outcome with the assumption that the food allocation mechanism within the household can be short-circuited. Suppose there is concern regarding the well-being of young girls in a particular rural area; specifically, there is a perception that they do not get enough food to eat. A possible policy response is the implementation of a school meals program in schools where girls are recorded as being particularly undernourished. However, the success of this intervention cannot be ascertained in the absence of information on the pattern of food allocation among household members—irrespective of whether the decisionmaking process is unitary or collective. Households might respond to this program by reducing the amount of food girls receive at home (and increasing the amount of food consumed by other household members). Understanding the existing patterns of intrahousehold allocation of food is a necessary prerequisite in determining the effectiveness of such policy interventions (Haddad and Hoddinott 1993).

POLICY AND MODELING OF INTRAHOUSEHOLD RESOURCE ALLOCATION

Kuhn (1970) points out that while the Copernican model of the universe initially resolved a number of the anomalies that had accrued within the Ptolemaic system, it did not immediately offer improved predictive power over the often convoluted ad hoc extensions of the older model. Similarly, despite the accumulated evidence against income pooling, the unitary model, bolstered by ad hoc assumptions,

retains an impressive ability to explain the new body of evidence on inequality within the household. Moreover, despite numerous rejections of income pooling and of polar cases of altruism within a family, to date, no one model of collective behavior dominates the alternatives posed. In other words, does the analytical complexity associated with collective models of household behavior offer any additional insights for policymakers? First, some general observations, before specific areas where the choice of model is important are noted.

Under a welfarist approach to poverty alleviation, transfers are more efficient than price subsidies if decisionmaking is unitary. Under a non-welfarist scenario, with unitary decisionmaking, the efficiency of transfers holds when planners' objectives (weights on individual welfare) match with those of the household (Tobin 1970), although Ross (1988) illustrates how such differences of objectives can make in-kind transfers efficient interventions. If the two sets of preferences do not match, possibly due to some externalities in investments or because policymakers (or a subset) have a different preference for female survival than do some households in the society at large, then there are still a range of interventions in wage and price policy that may be used in the context of unitary decisionmaking to shift household allocation closer to social objectives.

A fair portion of the literature on gender discrimination in health and schooling can be viewed in this context. For example, the findings of Rosenzweig and Schultz (1982) imply an impact on female child survival if credible policies can be found to narrow male-female wage gaps. Similarly, Alderman and Gertler (1993) and Alderman et al. (1992) imply roles for price policy in health and schooling allocation across boys and girls without a need to shift relative control of income.

If, however, household allocation is collective, it makes little sense to discuss a match between the preferences of the planners and the household. In a technical sense, interventions that aim to shift budget allocations merely weigh the individuals' utility differently than does the household head. Now, non-welfarist objectives can be achieved by taking advantage of existing gender roles (for instance, directing transfers to improve household food security to women). However, from a practical standpoint, it may not be useful to focus on the preference of one individual for, say, investment in children; only in rather special circumstances do the preferences of a single individual determine resource allocation. Welfarist objectives are more difficult to determine in the absence of a "standard" household utility function. Thus, the current inability to distinguish between alternative collective models limits exact measurement of the welfare effects of policy.

However, this does not prohibit identification of four areas of policy in which neglect of the decisionmaking process could have serious consequences in terms of policy failure. The first concerns the effect of public transfers made to the household. The unitary model predicts that the impact of such transfers is unaffected by the identity of the recipient. Second, at a project level, the unitary model implies that it does not matter to [illegible]olicy initiatives are directed. Given information sharing, the response to that policy will be recipient-independent. This gives rise to two potential policy failures: (i) the nonadoption of particular policies; and (ii) unintended costs arising from policies that are adopted. Nonadoption and unintended policy consequences through attempts to facilitate the adoption of new technology or of practices to retard environmental degradation are illustrated below. Third, the unitary model diminishes the potential importance of a number of policy initiatives, such as civil law and property rights, which have long policy handles.

Finally, the nature of interactions between household members will determine whether public transfers are mitigated or enhanced by changes in private behavior.

Targeting of Transfers and Income-Source Dependence

As discussed, the claim that household decisions are independent of the identity of the individual receiving income (income-source independence) has been refuted in a number of settings. The implications of this refutation for public transfers are illustrated by the following quotations:

> Many participants in the public debate concerning actual government transfers take it for granted that intrafamily distribution will vary systematically with the control of resources. When the British child allowance system was changed in the mid-1970s to make child benefits payable in cash to the mother, it was widely regarded as a redistribution of family income from men to women and was expected to be popular with women (Lundberg and Pollak 1992).
>
> Indeed, so convinced did some Ministers become that a transfer of income 'from the wallet to the purse' at a time of wage restraint would be resented by male workers, that they decided at one point in 1977 to defer the whole child benefit scheme (Brown 1984, cited in Lundberg and Pollak 1992).

Compared to the creation of a new instrument that so overtly transfers income "from the wallet to the purse," other programs may achieve the same objective under a non-welfarist banner. Food stamps, which often are found to influence spending in a manner different from cash, despite models that show their theoretical equivalence (Senauer and Young 1986), may be an illustration. Food stamps are not directed at women per se, but because women are the main food purchasers, the new delivery mechanism creates an entitlement to the transfers.

Similar considerations are at play, for instance, as to whether labor should be remunerated with food or cash in a public works scheme. One of the many factors entering into the decision is the likely profile of program participants. When the nature of the work

and the level of the wage offered are such that many of the participants are predominantly male, some have argued that remuneration should be in the form of food due to differences in male and female expenditure patterns. Evidence from Sub-Saharan Africa, Latin America, and South Asia shows that women are more likely to spend their income (controlling for all other observable household characteristics) on food, nutrients, and fuel.

The importance of the class of potential policy failures centered on control of income is likely to grow as social safety nets are designed to ameliorate the short-run negative impacts of economic adjustment. Newman et al. (1991) found that in Bolivia, the Social Emergency Fund activities, mainly targeted at the construction industries, did bolster the incomes of the poorest in a cost-effective manner. But the Fund only had a 2 percent female participation rate. The untested assumption seems to be that intrahousehold income redistribution will ensure that the fund income will reach wives, mothers, and children.

One important implication of income-source dependence is the breakdown of separability in the Singh, Squire, and Strauss (1986) model of the agricultural household; one cannot conceive of maximization of the profits of the firm without addressing individual incomes and consumer preferences. As indicated in the discussion of income pooling, the relative increase in various human and physical capital investments following increases in female and male earnings may differ. Moreover, there are apparent inefficiencies in input allocation that may be explained by collective models of the household firm. In situations where production is divided into individual and collection production, the implications for supply response elasticities are important.

An empirical investigation into just such a situation is found in Puetz (1991). For The Gambia, supply elasticities are estimated for

groundnuts, which are grown through separate production by individuals, and cereals, which are grown collectively through joint production by all compound members, with the compound head retaining control of the harvest and disposal of the crop. Puetz analyzes the response of production to increasing groundnut prices. If only individual plots are analyzed, supply elasticities are low. When collective plots are included in the calculation, the supply elasticity rises. This demonstrates the importance of examining the role of the wider collection of individuals that determine the welfare of each individual, irrespective of whether that grouping is called a "household" or a "compound." Puetz notes that it would be understandable not to look into groundnut supply response on collective plots, "since it is conventional wisdom in The Gambia that collective production is mainly geared towards producing food for a common granary. The results of the present study show that collective production is more flexible in crop allocation than anticipated" (p. 103).

On the demand side, if preferences are not unitary, some collective models imply price elasticities that differ from conventional demand theory.[17] Most price policy, however, is designed on the basis of models that use a representative consumer or a few sets of consumers based on region and income to portray an entire economy. In the presence of unitary preferences, it is not apparent that refined estimates of demand elasticities from further disaggregation of households will lead to new price instruments. However, if preferences are not unitary, gender- or age-specific price indexes exist, and price movements can reallocate resources within households. Therefore, when targeted income-transfer programs are costly to administer, price policy may be more efficient than lump-sum transfers.

Paying Attention to the Intrahousehold Ramifications of Policy Initiatives: The Efficacy of Polices to Encourage Technology Adoption and the Reduction of Environmental Degradation

The second type of policy failure precipitated by a reliance on the unitary model results from the assumption that it does not matter to whom policy initiatives are directed. Only in rather special circumstances do the preferences of one individual determine resource allocation for the household. It should be kept in mind that the failure in policymaking to appreciate the ramifications of a policy among household members can occur when that policy is targeted to one household member by default, or when it is explicitly targeted to a particular household member. In the environmental context, both the nonadoption of appropriate technology and negative consequences of adoption constitute policy failure.

There are a number of examples of the nonadoption of policies designed to improve crop technology (Quisumbing 1993). Jones (1986), reported the results of a project in Cameroon to encourage women to produce rice. In the study area, rice was considered to be a male crop. Any income generated from it would have been controlled by men, even if the crop was produced by women. Consequently, few women entered into rice cultivation. Instead, they continued to grow sorghum, despite its lower returns, because they controlled the harvested product. In Zambia, households were encouraged to intercrop maize, a male crop, with beans, a women's crop (Poats 1991). Researchers hoped that households would take advantage of well-known complementary nutritional benefits of the two crops. In addition, they hoped that the overall amount of weeding time would be diminished, through the simultaneous weeding of both crops. However, women opposed this innovation because if beans were planted on land normally allocated to maize, they lost ownership of the beans and the men benefitted from the cash generated by their sales.

That extension workers routinely ignore women farmers when new technology is introduced is well documented. For example, in Malawi, Gladwin and McMillan (1989) found that a groundnut seed multiplication project was introduced to male household heads, despite the fact that groundnuts were recognized as a women's crop while tobacco, cotton, and hybrid maize were considered men's crops. Extension agents argued that the program was "too complicated" for women to understand. The exclusion of women from the project resulted in a loss of cash crop income for the wives of program participants.

However, it is not only the promulgators of the technology that ignore women, but also those who seek to facilitate technology adoption through, for instance, credit provisioning. Again from Malawi, Gladwin and McMillan (1989) found the incorrect perception that married women were indifferent to the receipt of "farmers club" credit, either directly, or indirectly through their husbands. In fact, women were "full" club members because they did not have a man to be an intermediary—it was a social stigma. Under these circumstances, married women may indeed prefer the indirect route, but a first-best solution is to have a separate credit club for women farmers.

Examples of the overly narrow policy focus on one household member can be found in the many attempts to introduce new technology for effective environmental resource management. Garrett and Espinosa (1988) document one such example from Ecuadorean Indian communities. In these communities, both men and women traditionally own and control land and animals, with control being governed by a complex set of property rights within the family. When an erosion control system was being designed, the technicians only consulted the male household members. During the implementation phase, women demonstrated against the project, and refused to have their fields divided by the trench.

A similar failure of policy occurred in the context of a reforestation initiative in the Dominican Republic. The initiative was predicated on the assumption that men and women used wood for the same purposes. Fortmann and Rocheleau (1989) note that this reforestation project did not consider the possibility that men's needs from the forest may differ from women's needs, consequently only men were consulted. As a result, the intercropping of cash and subsistence crops and the planting of indigenous and exotic pines for watershed management and timber were emphasized. Women were only consulted during a midproject evaluation and it turned out that their needs were not met by the project. Women needed trees for fuelwood supplies and for palm frond fiber for basket-weaving. The scarcity of fuelwood forced some women to give up their cassava bread processing operations due to time constraints. Since technical assistance to the project was available only during start-up, women's needs for fuelwood—recognized so late in the project—could not be addressed.

The above examples embody targeting by default. However, deliberate targeting of an initiative does not necessarily diminish the probability of adverse unintended impacts. An example of this in The Gambia is provided by von Braun and Webb (1989). In the early 1980s, rice irrigation was introduced to an area of swamp rice production in order to raise yields, commercialize the product, and raise women's share of household income. However, an initiative intended to raise female income shares ended up reducing them. Previously, women were the rice growers. Yield increases transformed the status of rice from a private crop under the control of women into a communal crop under the control of men. The choice of technology and the attempts by donors to protect female rights were based on observed outcomes of household decisions, which left the production of rice under the control of women. However, the process of decisionmaking was not fully understood and rights not sufficiently

protected by project management. Thus, males in the community were able to shift the equilibrium of resource allocation to reflect preproject preferences and to take control over the new resources offered by the project. It is not, of course, clear that a fuller model of household resource allocation would have led to measures to ensure that the donor's intentions were realized. Nevertheless, a perspective that viewed individuals as interdependent (rather than as independent agents) might have led to an expectation of responses by males to changes in women's assets and productivity.[18]

By contrast, a project in Togo to encourage soybean production succeeded precisely because it took into account the collective nature of household behavior (Gibbels and Iddie 1986, cited in Dankelman and Davidson 1987). At the outset, the project was targeted to women. Exchange visits were arranged between soybean and non-soybean growing villages. Workshops were organized in women's homes (it was argued that homes are more effective training places than an unfamiliar urban center). Women returned to their villages after these workshops to train other women. In addition, soybeans were not introduced as a cash crop. They were promoted as legumes that could be used to make sauces. Thus, men did not become interested in cultivating soybeans and even allowed women to utilize small plots of land for soybean cultivation.

The nonadoption of new technology in the area of family planning is another example of the failure of a deliberately targeted initiative to achieve its stated goals. Most fertility research assumes that the household can be treated as a unitary decisionmaking unit (so-called "one-sex" models), even though married men and married women may have very different ideas about how many children they want. Rao and Greene (1991) model the fertility decision as a "two-sex" decision. They use a bargaining approach to examine how "credible threats" (that is, the ability to support oneself outside of marriage)

affect fertility decisions and find that increased female earnings decrease fertility, while increased male earnings raise fertility. They conclude that men's characteristics must not be ignored in the study of fertility determinants, and argue that the income results are most plausibly explained in a bargaining framework—women are less keen than men to have additional children. Their first conclusion is supported by evaluations of prenatal interventions in Thailand (ICRW 1990). Evaluators found the most successful family planning centers to be those that made a point of seeking male participation in classes.

Ignoring the "Long Reach" of Policy

Perhaps the most underrated drawback of relying on the unitary model for policy guidance is that a number of potentially powerful policy handles are disabled. Under the unitary model, policymakers affect intrahousehold resource allocation primarily through changes in prices. Some, but not all, collective approaches suggest that additional policy handles, often with a very long reach, are available to the policymaker. The "long reach" policy handles depend on the existence of rights that are credible in the sense that should they be violated, they obligate action. However, the policy handles do not depend on this action for their effectiveness.

To see this, consider the following model in the context of more equitable access to common property resources (CPR). Within a household, there are two individuals, each with access to a production function that produces output as the result of two task inputs. There is comparative advantage in the tasks, so it pays to cooperate and specialize in tasks. But how are the gains from cooperation to be divided? Let the fallback option for each individual be identified with the outcome of working alone. Now, suppose that the government introduces a scheme that guarantees better access for all to common

property resources. How will this affect intrahousehold inequality and, in particular, the well-being of the individual with poorer pre-intervention access? If the income generated from improved access is higher than what the women could previously earn on their own, but is still less than the income from cooperation, even though the common property is not actually used, more equitable access actually improves intrahousehold equality. What is remarkable is that the scheme has a long reach—it equalizes intrahousehold allocation by altering outside options, despite those options not being taken up (Haddad and Kanbur 1992b).

Of course, the credibility of the guaranteed access is at the heart of the matter. If rationing limits the ability of women to raise their fallback utility, then there will not be an impact on intrahousehold allocation. Other intrahousehold allocation issues also come into play—if improved access is only guaranteed for married women, the threat points outside the marriage are unaffected by the policy choice. Improved access to CPRs for women outside as well as inside marriage will result in CPR reforms that are better able to alter intrahousehold resource allocation.

Similarly, programs that raise the equality of access to credit, even if the credit is not utilized, may affect intrahousehold resource allocation. There are a number of successful programs that allow women, for example, to enter into agreements as individuals rather than as wives (often on the basis of shared liability with other women, as in the Grameen Bank program in Bangladesh). This, then, can be viewed as a subset of the category of creating property rights.

More generally, many collective models imply that changes in the legal environment have an indirect impact on family allocation through changes in relative bargaining position as well as the direct impact when the laws are applied. Thus, Folbre (1993) calls for a review of gender bias in law as a foundation for social policy. Similarly, she

points out pervasive biases in divorce and child support laws that cause intrafamily and intragenerational inequality.

In many societies, there is a particular need for property rights that allow women to hold assets as individuals rather than as wives and trustees for minor children. For instance, women may be unable to utilize environmentally sound technologies due to an insecurity of land tenure, the absence of rights to grow trees, and an inability to initiate land improvements without the permission of the male head of the clan (FAO 1991; Bruce 1989).

While concluding, along with others, that such legislative reforms can have far-reaching effects on the welfare of children and adult women, Folbre also acknowledges that such biases in civil law often reflect preexisting biases in common law and religious strictures. Sen (1990) takes this observation one step further. Often the legal and social inequalities reflect perceived legitimacy as seen by women as well as men. This, in turn, parallels perceptions of relative contributions to the household in which cash earnings are valued more than unpaid labor. Women often do not see themselves "entitled" to a larger share of household resources. This, in turn, leads to inequalities in investments in physical and human capital and a feedback cycle that reinforces inequalities that is difficult to break.

This implies, firstly, that legislative solutions to intrahousehold inequalities need to overcome the biases of male policymakers. Moveover, it indicates that were a coalition of advocates of increased rights for women and children able to achieve a success in civil law, enforcement of those laws is likely to be problematic. Thus, while "getting the legal environment right" may be a cornerstone in a program to achieve greater intrahousehold equality, measures that change incentives and that change perceptions of

entitlements might be necessary to achieve the full potential of such legal reforms.

For example, a set of polices to improve access to schooling for girls should understand the nature of demand for such services. The existence of social biases should not necessarily be used as an excuse to do nothing. However, policy should be sensitive as to whether mothers and fathers feel girls are "entitled" to as much schooling as boys. Policies that attempt to shift the supply of services from boys to girls should be aware that current perceptions, however malleable over time, may slow down the attainment of policy goals.

So far, this discussion of "long-reach" policies has relied upon McElroy's extra environmental parameters or EEPs, a feature of Nash-bargained collective models. However, the qualitative implications of the various alternative collective models are not sufficiently similar, and those who point out the limitations of the unitary model for policy analysis must be judicious in their championing of collective models. For example, the most general form of the sharing rule in Bourguignon et al. (1992a) does not have the "long-reach" implication, although sharing rules that are Nash-bargained can be considered. It should also be remembered that Nash cooperative bargaining models may indicate no effect if a policy changes the distribution of transfers within a union but has no effect on the threat point. An illustration of such a policy is a shift in the distribution of child support supplements from fathers to mothers, but leaving intact the distribution of support payments to mothers in the event of a divorce (Lundberg and Pollak 1992).

Intrahousehold Altruism and the Offsetting of Policy Goals

It was noted that changes in private behavior may offset public transfers. In models such as Barro (1974), altruism on the part of private agents undoes the effect of government policies that increase

the incomes of the current generation at the expense of future generations. If intergenerational altruism, one form of the unitary model, is replaced with exchange motives, this result no longer holds. In a developing country context, the following example (adapted from Cox and Jimenez 1990) illustrates this feature. Consider a hypothetical family with young members residing in towns and old members living in rural areas. Transfers are made by the altruist "young" to the old, and individual consumption is a function of aggregate income. Suppose a social security program is introduced that taxes the young and subsidizes the old, leaving aggregate income unchanged. This might well lead to a reduction in urban-rural remittances, with consumption by individual members unchanged. However, suppose that these young-to-old transfers are undertaken in exchange for some in-kind service (such as looking after cattle). The transfer would be an amount equal to what the recipient would have received working as a casual laborer. Now the social security program uses urban wage taxes to subsidize rural wages. As a result, the urban household members must transfer higher amounts to their elders, because the opportunity cost of looking after the cattle has increased. This is the opposite result of that predicted by the altruistic unitary model.

The empirical work of Altonji, Hayashi, and Kotlikoff (1992) as well as Cox and Jimenez (1992) has been motivated, in part, by a desire to test the policy implications of such a model of intergenerational altruism. An analogous possibility exists for intrahousehold transfers from husbands to wives. While the polar position of perfect altruism may be hard to defend, the degree of partial crowding out is not measured in most models. This, again, makes assessment of the impact of targeted transfers imprecise.[19]

Consequences of False Rejection of the Unitary and Collective Models

In conclusion, can it be argued that under many circumstances, acceptance of a unitary model of the household, when it is inappropriate, has more serious consequences for policy than the false rejection of such a model? In the context of the policy failures just outlined, a cautious "yes" is argued for.

In the area of targeted interventions, consider the targeting of resources to women. False rejection of the collective model implies (erroneously) that targeting resources to women is pointless; thus, an efficient means of directing resources to women and children is foregone. False rejection of the unitary model implies that the costs of targeting could have been avoided. Even if there is a wide confidence interval on the differences entailed by collective models, most imply either more, or at least no less, investment in children from increasing resources controlled by women than the unitary model.[20] Thus, unless there are significantly higher costs to targeting programs to women in poor households, rather than to poor households as a unit, the available evidence may be considered adequate to indicate that false rejection of the collective model is the more serious error. An exception, however, might occur if, in addition to different rates of investment in children, males and females have different gender biases in these investments (Thomas 1991). In such a circumstance, a targeting of transfers may leave some children worse off.

Moreover, few programs that target women are costless. For example, they may impose extra time burdens on women, reducing the welfare of the woman herself and, possibly, her children. While most studies indicate that increased earnings for women offset any negative effects of reduced time for child care—an important factor in the production of nutrition and health (Leslie 1988)—the studies generally do not analyze the impact of an increased time burden that shifts rather than increases total household resources. Given that

similar examples of costs to participation in programs are indicated in the literature on targeting, greater precision in measuring the benefits to intrahousehold targeting may be necessary to determine optimal program design.

Regarding nonadoption of development initiatives, the consequences of the false rejection of the collective model in terms of nonadoption or adoption with unintended effects has been noted. False rejection of the unitary model again implies that the costs of understanding the needs and constraints of all household members could have been avoided.

For long-reach policy handles, false rejection of the collective model eliminates many policy instruments that could have far-reaching and profound effects on the lives of the most vulnerable of household members. False rejection of the unitary model means that these long handles are not connected to the policy machine, and energy will be wasted in pulling on them. For the intergenerational policy example, false rejection of the collective model implies that the effect of the tax policy is the opposite of its intent: instead of reducing urban-to-rural remittance flows, the urban wage tax-rural wage subsidy has increased urban-to-rural remittance flows. A false rejection of the unitary model will again lead to impact being the opposite of intent, although the relative magnitudes of each false rejection is hard to predict.

CAVEATS OF THE COLLECTIVE MODEL AND POLICY RESEARCH PRIORITIES

It was noted that although the collective approach to intrahousehold decisionmaking is more plausible on theoretical and empirical grounds than the unitary model, a large number of researchable issues remain that are relevant for policy. Collective models of household behavior have four strengths: they address the issue of preference aggregation; they have empirically distinguishable

predictions; they highlight important policy considerations; and they are supported by a diverse set of empirical tests. However, there are several caveats worth noting that lead to the policy research priorities discussed in this section.

First, caution is required in interpreting a number of results supporting collective models of household behavior. As discussed, it is difficult to separate the effects of individual preferences from those of differences in endowments and productivity. Thus, tests of differences in behavior may be biased by heterogeneity. Further work on collective approaches is necessary to improve their predictive power and enhance their usefulness for public policy.

Second, the comparative statics of most collective models take the operations of the marriage market as exogenously determined. Relaxing this assumption alters the impact of policy changes on household behavior. Lundberg and Pollak (1992) consider the effect of payment of child allowances to women. Using a cooperative model, they show that such a scheme will initially improve the intrahousehold distribution of resources in favor of women. But suppose that household formation is preceded by some form of binding agreement (such as a prenuptial contract) that includes the promise of transfers from husband to wife. Once the new child allowance scheme is in place, one might expect that husbands would reduce their transfers. As Lundberg and Pollak (1992, 21) note,

> with binding transfers, the distributional effect of a policy changing the recipient of child allowances will, therefore, persist only within marriages in existence at the time of the policy change. For subsequent generations of marriages, adjustments in prenuptial transfers will exactly offset the shift in child allowances.

Finally, Sen (1985) notes that bargaining amongst members is also a function of their perceived contribution to the household. The individual perceiving making the larger contribution can expect to

obtain an outcome more favorable to him or her. This may place women at a particular disadvantage, as much of their contribution may take the form of nonmarket labor, which is less visible than wage employment. The distinction between actual and perceived behavior is rarely made in collective models of household behavior. Woolley (1992) is a recent exception.

Policy research priorities follow from these caveats.

Incorporating Dynamic Cultural Processes

A number of the key studies on intrahousehold allocation recognize a dynamic cultural process. For example, Folbre (1993) implies that public policy is not separate from inequalities in the household; policy can easily be shown to cause that inequality, but is also a reflection of the attitudes that determine household allocation. In another context, Sen (1990) sees a second feedback loop in which perceptions of self and personal welfare are both causes and results of inequalities.

Understanding the first loop may allow one to determine at which points the system is most subject to intervention and at which points economic and legal reforms can work in synergism. From the standpoint of research, these interactions imply a broader set of tools than often used by a single discipline. Generally, the very nature of intrahousehold research—being so rooted in cultural concepts of division of labor, attitudes towards status within households, and perceived versus actual contributions—would seem to benefit from a multidisciplinary approach. Promising areas for such work include (i) the use of information collected in a qualitative manner and yet accessible to "quantifiers," such as the creation of variables for "respect," "status," or "apparent prosperity," and (ii) an investigation of the cultural norms that often override the intent of

social legislation. This, then, links with the second feedback loop depicted by Sen.

Sen's (1990) discussion of perceived interests and perceived legitimacy raises a number of ethical issues that can only be alluded to here. It can be presumed that many policy makers are comfortable with the advocacy of individual rights (usually of children or exploited women) implied in most policy prescriptions. However, in some cases, social policy attempts to promote rights that individuals do not currently see as legitimately theirs, although they—or their daughters—may do so once the feedback cycle is reversed. With sense of self, and intrahousehold allocation endogenous over the long run, there is a clear conceptual distinction between dynamic welfare consideration as opposed to paternalism. However, the measurement of the effect of interventions in such a context may require new research tools.

Understanding the Links Between Intrahousehold Resource Allocation and Household Formation and Dissolution

Researchers on household resource allocation are only beginning to explore the links between models of household formation or dissolution and current allocation. This, then, points to another dynamic aspect of intrahousehold allocation processes. Current allocation may reflect implicit agreements made at the time a union was formed, subject to new information (including unanticipated income and fertility shocks). Moreover, the process of living in a union reduces asymmetries of information as well as creates human and physical capital specific to the partnership. Furthermore, the time path of transfers and services often creates incentives to renege on agreements—a classic example being a spouse abandoned after having invested in the human capital of the other. While there have been a number of theoretical and empirical advances regarding the dynamic

process of such agreements and incentives to renegotiate, the topic remains a priority both for intra- and intergenerational agreements.

The Need for a Life-Cycle Perspective

One additional dynamic process needs to be addressed. The empirical literature has utilized nonlabor income to test allocative processes, although such income often reflects past investments or labor force decisions. Thus, some econometric innovations, including application of panel approaches, may be required to identify the potential effects of transfers or other feasible policy measures on household allocation. Similarly, a well-designed experiment that studies the effect of randomized targeting of transfers could, in principle, provide greater precision to some of the estimates of intrafamily response than currently available. Valuable (and costly) as such a study may be, it will measure the response of a household to a short-term intervention (similar to many government programs) but will not necessarily indicate how individual positions change when entitlements are perceived to shift permanently.

The additional data requirements for such research are considerable. Many models can only be tested with data disaggregated by individual. Furthermore, the ideal data set includes enough information to distinguish life-cycle allocations from gender- and endowment-specific patterns and has data on inheritance and dowries. Clearly, the process of collecting such income, consumption, and activity data on an individual basis poses a time burden on the household. Such data collection often is more intrusive than other forms of household data collection, since it may be strategic for individuals not to reveal all their income. Moreover, one often requires data on incomes and assets of family members who are not coresident as well as transfers to and from these individuals. Indeed, sibling models are a main means of testing some of the

intergenerational models mentioned above. For more on the data collection implications of intrahousehold research, see Levin, Ralston, and Haddad (1993).

The Role of Qualitative and Participatory Data Collection Methodologies

Minimizing the costs of false rejection of the unitary model is related to a better understanding of the policymaking process and more cost-effective collection of data that takes a wide-angle view of household interdependencies. One potential means of simultaneously reducing the costs of collection and obtaining a holistic picture of household, family, and community operations is through Participatory Rural Appraisal (PRA) techniques. Although untested vis-à-vis other data collection methods, these qualitative techniques are increasingly mentioned as a way of complementing the blunter, if more measured, quantitative survey approaches. The essence of PRA is subject participation in the identification of either problems or solutions. PRA techniques are potentially useful for emphasizing the point that intrahousehold resource allocation does not simply mean an increased focus on the individual per se, but also on the patterns of relationships that individuals forge with others not necessarily from their own household or family, patterns that are relevant in determining the resource flow of interest.

Collective Models of Production

In general, the relevance of research on intrahousehold issues would be enhanced by identifying whether or not the household represents the relevant group of decisionmakers. There is a need for policy to look beyond households towards other institutions, such as the family, community, and other social groupings. The poverty of children is possibly less determined by household structures than by

the degree to which fathers—regardless of marital or residential arrangements—contribute economically to children. However, while there is a large body of evidence that indicates differential access to household physical capital and different input use by gender (Dey, 1993; Saito 1992), there has not yet been a systematic attempt to use insights from intrahousehold models to explain these patterns. Similarly, although projects have been shown to fail due to imperfect flow of information between household members, less attention has been given to putting these observations into a model of a firm than has been given, to date, to intrafamily consumer allocation. The work by Puetz (1992) is a step in the right direction, but there is much more work to be done on this issue.

CONCLUSION

The policy failures associated with accepting unitary models when they are inappropriate are more serious than erroneously accepting collective models. In making this claim, the approach has been illustrative rather than exhaustive. In writing this review, the authors are conscious of having produced more questions than answers. This is regarded as an entirely positive outcome. Just over a decade ago, a conference on intrahousehold resource allocation (subsequently published in Schlossman and Rogers 1988) focused on whether going inside the "black box" of the household would yield any useful insights. As the literature reviewed here demonstrates, the answer to this question is an emphatic "yes."

Unfortunately, the majority of gender and intrahousehold-disaggregated analyses of development policy issues have yet to lead to a consensus beyond this "yes." There are at least three reasons for this: (i) by their nature, the results of gender and intrahousehold analyses are specific to cultures and are difficult to generalize; (ii) there is confusion over which conceptual model of the

household to use, both across and within social science disciplines; and (iii) the collection of many intrahousehold data sets is not driven by policy questions.

Thus, the new challenge is to produce generalizable results that are useful for policy formulation. In this regard, it would seem desirable to apply a common conceptual approach to the analysis of a number of policy-oriented case studies from a regionally diverse set of countries. Hypotheses related to these studies could be developed and tested with and without the benefit of intrahousehold information in order to carefully measure the trade-offs between the additional project/policy insights derived (and the mistakes avoided) and the extra burdens of the analysis itself.

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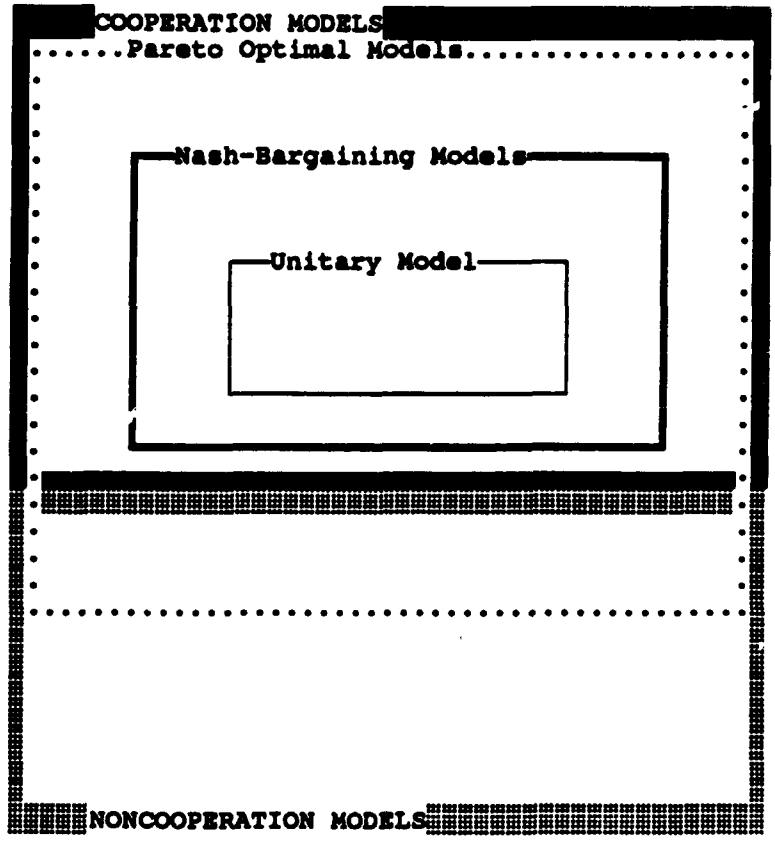
Figure 1.1—Models of the household



1. Models used for examining how resources are allocated among a group of individuals are most usefully employed if they can be applied to that group of individuals that exhibits the greatest social and economic interdependence. This group of individuals can be characterized in a number of ways: coresident, eating from a common "pot," and blood relatives, to name but three. Of equal importance to the usefulness of intrahousehold models is some knowledge of how the group of individuals came together in the first place.

2. This figure is based on Marjorie McElroy (1993).

3. Some noncooperative, collective models—under certain conditions—rule this out, but none so completely as the unitary model.

4. It is also possible to model divorce as the outcome of a dynamic process within the household. In Paterson's (1985) model of marital dissolution in Yoruba households, husbands enter into a contract with their wives, whereby their wives supply labor services in return for payment. However, wives use some of this payment as a means of accumulating capital, and once a certain amount is obtained, women may divorce their husbands and establish themselves as independent traders.

5. If separability does not hold, the distinction between the unitary and collective models becomes more important.

6. Pollak (1985) discusses some of these issues more formally.

7. It should be noted, however, that noncooperative models can also, under certain conditions, be Pareto optimal (Figure 1.1).

8. Manser and Brown (1980) add an efficiency parameter to these utility functions, capturing the idea that living together might generate some intangible benefit or cost that enhances or reduces the utility associated with the consumption of goods.

9. For example, Horney and McElroy (1988) (cooperative); Ashworth and Ulph (1981), Kooreman and Kapteyn (1990) (noncooperative); and

Apps (1982), Apps and Rees (1988), and Chiappori (1988b) (Pareto efficient).

10. See, for instance, Kumar (1979), Tripp (1981), Pahl (1983), and Engle (forthcoming), as well as the studies cited in Dwyer and Bruce (1988), Bruce (1989), and the special issues of *Development and Change* (1987) and *World Development* (1989).

11. Horney and McElroy attribute the weakness of their results to difficulties in obtaining complete information on rights to unearned income within the household.

12. This approach is called outlay equivalent analysis and was first developed by Deaton (1989). In that study, the outlay equivalent technique was applied to one year (1985/86) of data from Côte d'Ivoire. Haddad and Hoddinott (1992) repeated this exercise for the following year of data, and Haddad and Reardon (1993) disaggregated the approach for urban and rural Burkina Faso. None of the three sets of results find compelling evidence of a pro-male or pro-female bias in the allocation of household resources. Yet, a similar outlay equivalent analysis in India (Subramanian and Deaton 1990) did find parental expenditures skewed towards boys.

13. See Levinson (1989) and Heise (1992). Harriss (1989) raises this issue in the context of differential female mortality in India.

14. However, Tauchen, Witte, and Long find that in upper-income households, where the wife is the dominant wage earner, further increases in her income is correlated with higher domestic violence. Their model predicts the opposite result, though the result is consistent with studies by other researchers that find greater violence in households where men are at a relative disadvantage to their spouses.

15. Even these have been challenged as unlikely to provide unbiased instruments on the grounds of intergenerational links of unobserved productivities.

16. A welfarist approach to poverty assumes that the level of income indicates the welfare of the unit in question (household or individual) regardless of how the unit chooses to spend the income. A non-welfarist approach focuses on the consumption of one or more goods or services without direct invocation of the household's own assessment of the utility of consuming that good or service.

17. For example, Nash-bargaining models imply a different set of restrictions on the Slutsky matrix than standard models.

18. It is also not clear that any current model of bargaining or sharing would have predicted the virtual seizure of control that occurred. Nevertheless, the example suggests that in economics as in chemistry, a disturbance of an equilibrium leads to processes that tend to restore the equilibrium.

19. Similarly, while there is evidence that women's limited access to credit affects the allocation of inputs to agriculture, given that in some communities men purchase a portion of inputs used by women, the net impact of targeted credit for crops controlled by women is likely to be less than expected, due to reallocation by males.

20. Conversely, it may be possible to conceive of cases in which an increase in resources controlled by males has a negative impact on investments in children due to changes in bargaining or sharing rules that offset the male's (presumed) non-negative marginal propensity to invest. This has been alleged in regards to increases in incomes from cash cropping. However, these scenarios also generally presume a decrease of other incomes.

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